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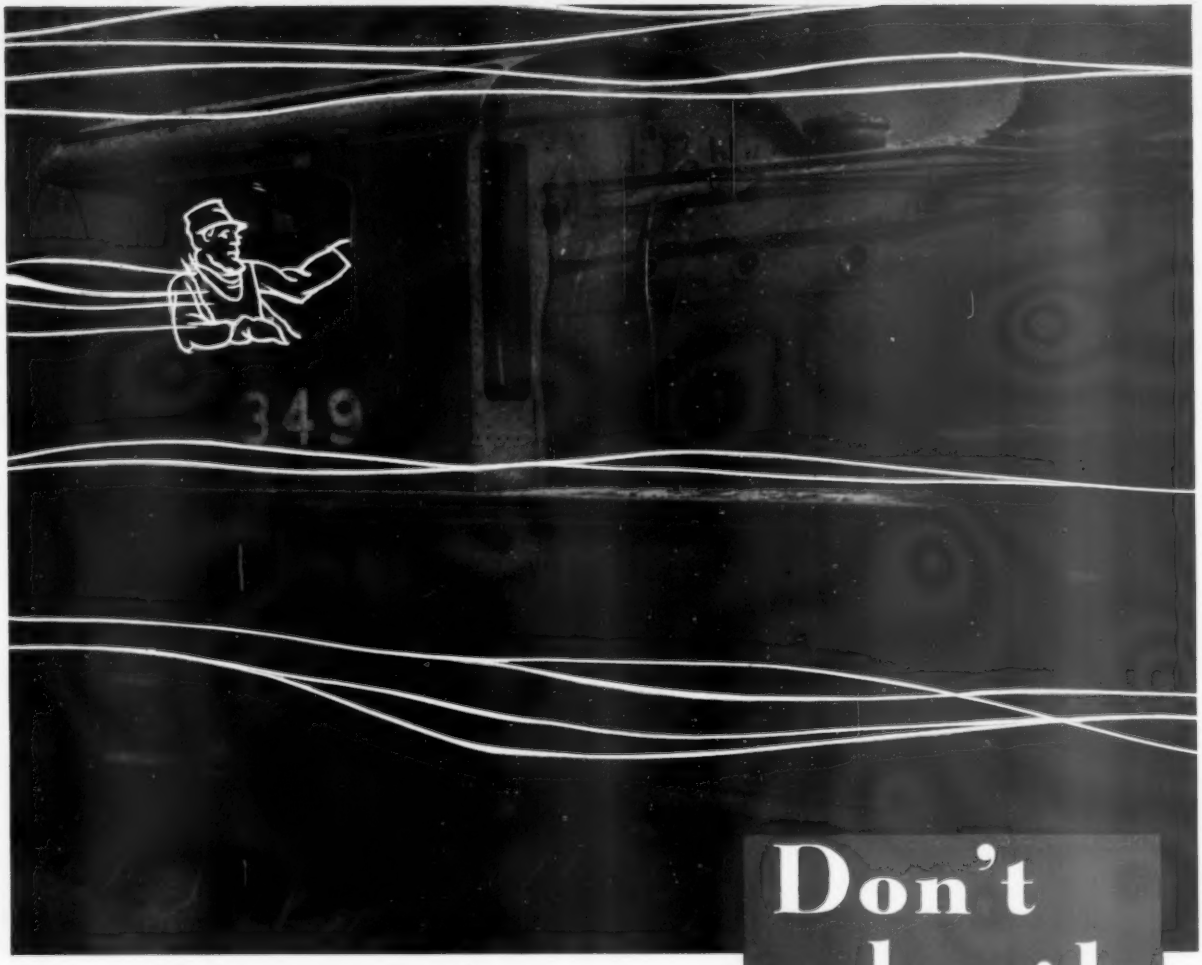

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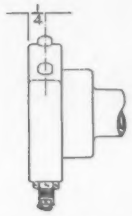

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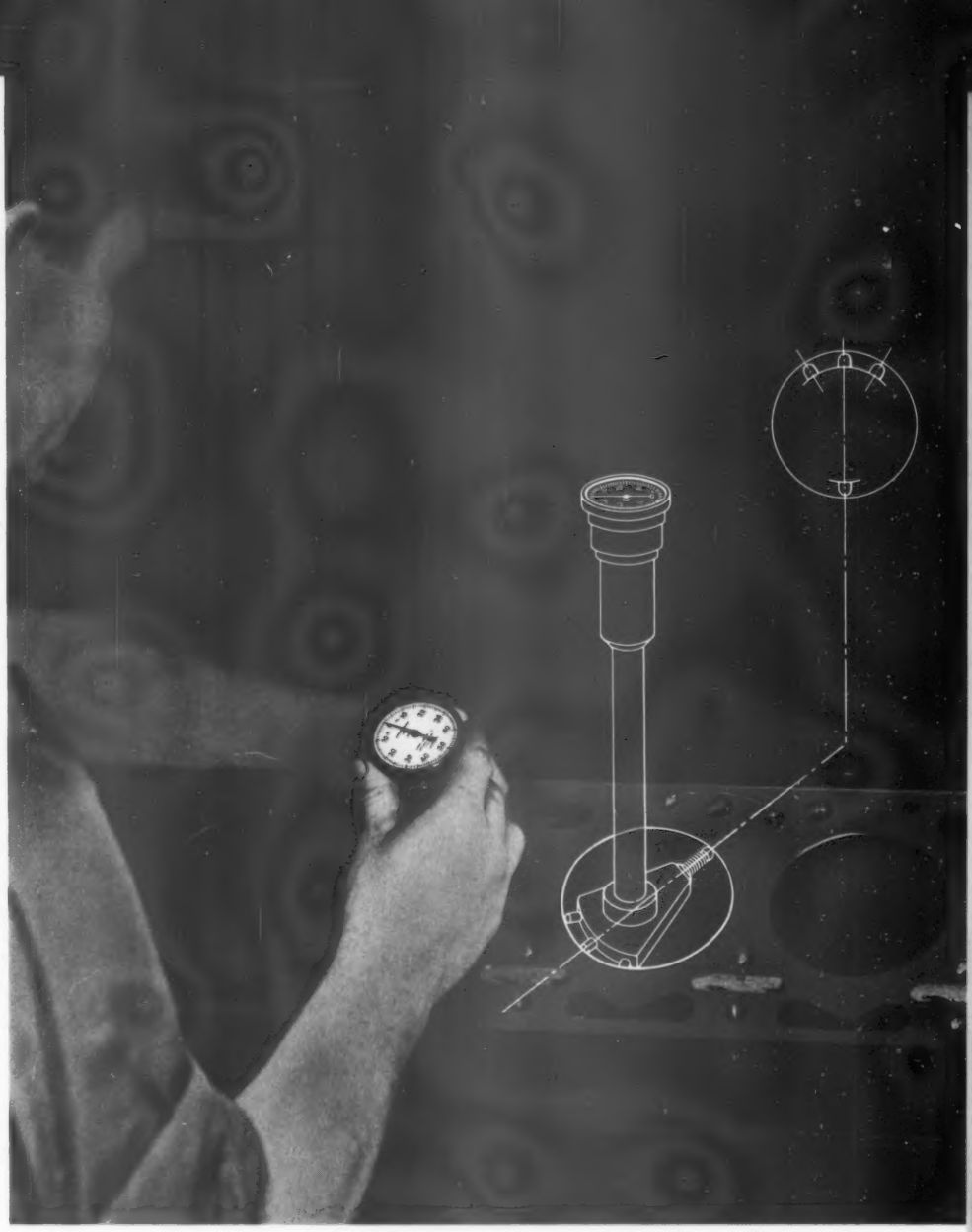

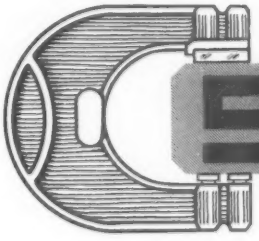

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Vol. VIII JULY, 1939 No. 3

Contents

NEWS

Chapter Doings, By George J. Keller 17

GENERAL

"The Tool Engineer and the Machine Tool Industry," By Tell Berna 9

TECHNICAL

"Rehabilitation of Industry as an Aid to Relieving Economic Stress," By E. C. Brandt 12

EDITORIAL

"The Displacement of Labor," By A. E. Rylander 7

A.S.T.E.

Chapter Doings 17
July Chapter Meetings 50
First International Chapter Formed at Toronto 36
California to Have Chapter 49

FEATURES

Handy Andy Says 22
New Equipment 38

ADVERTISERS' INDEX 54

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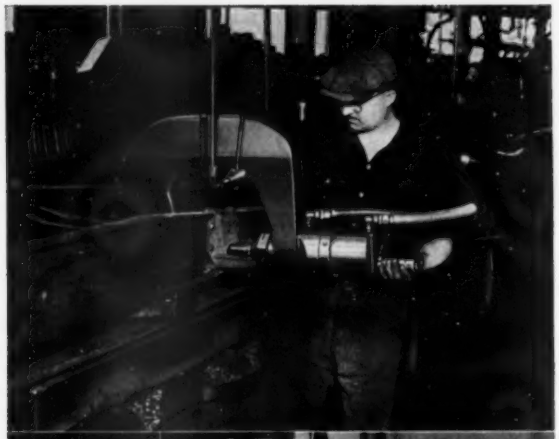

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The Displacement of Labor

AN EDITORIAL
by
A. E. RYLANDER

TOOL ENGINEERS, as all intelligent men directly engaged in the industrial game, know that machines create employment despite that the primal purpose of the machine is to displace labor. Let us, however, understand that term. The displacement of labor does not imply forcing labor into idleness; essentially, it means exactly what is stated, a displacement pending absorption into new industries or, preferably, retention because of industrial expansion induced by new business. We cannot blind ourselves to the facts; a machine designed to displace ten operators displaces them, and that's that.

In adjusting manufacturing costs to balance rising hourly wages and, latterly, extra book keeping, management naturally avails itself of every possible advantage afforded by modern equipment. Viewing this from one angle, one might be led to the conclusion that this results in unemployment; here, there and everywhere, we see workers displaced by the machine, become conscious of an increasing army of unemployed. At least, the anti-technological forces strive to impress that belief, find receptive listeners. What is not so readily apparent is rising employment among trained vocational workers and skilled craftsmen, evidenced by a wave of advertising for engineers, designers, tool and die makers. Comparatively idle while production workers were busy, these men now have their inning. That is balance of a sort, but not close enough for economic security.

Coldly analyzed, it is better that creative workers and skilled craftsmen be employed than that unskilled labor works, because the trained and skilled create employment for all classes; the untrained cannot, except to a limited degree, create employment even for themselves. This state, then, is the happier one because it is a temporary condition in a period of transition. We can agree, however, that an ideal condition would employ all who would work, and that means the majority of Americans. There is no evidence that we are suffering from a breakdown of the will to work.

Let us, now, devote a part of our native ingenuity toward putting men to work, if not for altruistic reasons then as a matter of good business. Let management encourage product engineers to evolve new and superior commodities, so that displaced labor can step directly from one job to another. We Tool Engineers can be depended on to design the machinery of production, will do our share to promote employment. A gap must be bridged, the structure adequate for the heaviest traffic.

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DAVIS BORING TOOLS

The TOOL ENGINEER *and the* MACHINE TOOL INDUSTRY

By

TELL BERNA

AS we look back over the development of American manufacturing enterprises, particularly in metal working, the field with which we are most familiar, I think we must be impressed by the very important part that has been played by the foreman in all of these years.

When I was a youngster, a foreman was a "maid of all work." He helped to select the new machines that were bought; he supervised the installation and saw that the machine was properly tooled up. In those days we didn't buy a machine for just one operation and concentrate on the very fine points of making just that one part, we bought a machine that went into the shop for anything that might come along; and when a new job came along, it was the foreman that figured out how it should be done.

And that wasn't all that he did. He had to get the orders into his department to determine which would be manufactured first. He had to make sure that the material was on hand for every order, and satisfactory material too. He had to be sure that the tools and the gauges were on hand, and that the blueprints were available, and he was the one that went into the drawing room and argued about details of design that made his problem harder, and tolerances that he couldn't meet on his equipment. He had to see that every job was started on time and yet take care of the emergency rush jobs that came into his department and interrupted the plans that he had carefully laid out, and then he had to get each job finished and passed by the inspector. In his spare time, he handled personnel problems, problems of safety, arguments about wage rates, and instructed the apprentices in his department. Yes, a foreman was a rather busy man.

Of course, a mass of detail of this kind is entirely too much under modern manufacturing methods, particularly as departments grow to larger size. The constant upward trend of costs, such as taxation and wage rates, endangering a profit margin already perilously narrow, mean that all of the foreman's problems must be dealt with as far as possible by experts. The solution is to back the foreman up with a Tool Engineer and a good cost accountant to help him carry on the search for methods to increase the output of each worker so as to compensate for increasing costs without wiping out the profit margin.

If there ever was a broad margin of profit that would absorb errors, delays and inefficient methods of manufacture, we certainly cannot look forward to enjoying it in the future. The United States Chamber of Commerce reports the case of a typical medium-sized business concern who wrote regarding its experiences last year when its sales volume was the largest since 1930, and one of the largest in its history.

Here is what has happened to that company during the last nine years:

In 1930 total earnings were $108,812. Wages amounted to $35,225. Taxes were $1,824. Net earnings after wages, taxes and other costs were $9,218.

In 1938 sales had increased five-fold to $543,856. Wages were $154,850. Taxes were $15,226—eight times the 1930 figure. Earnings had decreased to $2,205—less than one-fourth of 1930 earnings.

For the entire nine-year period 1930-1938 the company's sales were $2,613,000. Wages were $765,000 and taxes $60,000.

Total earnings for the nine years were $45,000, or an average annual return of slightly over 2 per cent on an investment of about $200,000.

This problem may not seem difficult to those large American industries who can employ experts in every division of their work, but the typical American manufacturing enterprise is not large, it is small. The National Industrial Conference Board issued a bulletin in February, 1938, based on data secured from the Bureau of the Census, and it shows that there were 162,000 manufacturing enterprises, with an average employment of 52.7 employees. The small enterprises far outnumber the large ones. We are all too likely when someone speaks of "American Industry" to think of Ford, General Motors, General Electric or Westinghouse without realizing that these are not typical enterprises, but the towering giants that command attention because of their size. It is in the relatively small plants that the Tool Engineer is needed, and here is a tremendous field for his skill.

Tool Engineer in the Small Plant

As a matter of fact, we in the ma-

(Continued on Page 11)

TELL BERNA

General Manager, National Machine Tool Builders Association

INSURED AGAINST PRODUCTION LOSS, TOO

THESE ARE FACTS

"The *'Greenfield'* engineer who suggested the use of 'Maxi' taps on this job gave us advice that has turned out to be the best possible insurance against production loss in our plant," writes this Pennsylvania Manufacturer.

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chine tool industry are aware of this growing tendency to analyze every operation on a strictly factual basis, and it has influenced our methods of selling machine tools. We try to figure out what the present method of manufacturing a piece costs, what the new machine can do, and then with these facts at hand, what the return would be on the investment required by a new machine tool, as well as the gain in accuracy and finish that might also have value to the manufacturer. Our responsibility does not end when the machine is delivered; it is usual for the machine tool builder's demonstrator to see that the part in question is produced in the time that has been estimated. From that point the Tool Engineer must carry on.

To an ever increasing measure, I look forward to a closer cooperation of the machine tool salesman and the Tool Engineer in this task of "following through" on the installation of a new machine tool, for it has been my experience, and surely yours as well, that a few weeks after that fine new machine has been installed production begins to fall off because the attention of the shop executives has now turned to other matters. The estimate of the machine tool builder, on the basis of which that machine tool was sold, was of necessity conservative, since, in a sense, it was a guaranteed production rate. It is possible that after the machine has been put in use and the operator becomes familiar with it and the Tool Engineer studies it, he may get even better results than the machine tool builder originally estimated. In any case, it is the Tool Engineer, with the increasing cooperation of the machine tool salesman, who must "prove out" that investment. You: for the purpose of securing all that you can from the money that has been expended. The machine tool salesman: for the purpose of increasing his own understanding of what the machine can do and to secure information that will help him on future transactions.

Today we are working in a replacement market. There are not enough new enterprises that require machine tools to keep us busy. Our field is the replacement of machine tools, some of which are still in running order, but which have been rendered completely obsolete by new developments in our field. The important thing to us, as to our customers, is what our machines can earn. How they are built; the materials we use; are important only insofar as they affect what the machine tool will do in your hands. That is the reason why this method of selling is rapidly becoming the prevailing policy in our field.

Machine Depreciation—Not a Bookkeeping Detail

Mr. Brandt has spoken (Mr. Brandt's talk published elsewhere in this issue) of the critical importance of adequate maintenance. I would like to suggest that perhaps some of our troubles are due to the lack of an adequate depreciation policy on the part of metalworking companies. The subject of depreciation is referred to the accounting department as a bookkeeping detail. It should not be that; it should be a very important part of the operating policy of the company.

The executive who just lumps all his machine tools together and applies a 10 per cent rate, if that's what the man from the Bureau of Internal Revenue will let him have, and considers that a depreciation policy; is very likely to find himself stuck with machines that are still in running order, but which have been rendered completely obsolete by more efficient equipment which perhaps is being purchased by his competitors. We, for our part, in our efforts to sell the new machine tool which this man sorely needs in order to reduce his manufacturing costs, are confronted with the objection that the old machine tool has not yet been written off, and so he continues an inefficient operation merely because of a misleading bookkeeping entry.

In view of this tendency to manage manufacturing methods in a more careful way, based more on study and on facts and less on opinion, it is not surprising that a part of the membership of the American Society of Tool Engineers are machine tool salesmen, both those who work for the machine tool builder and those who work for the dealer, and we have much to learn from you.

In spite of the short time that the American Society of Tool Engineers has been in existence, I am informed by Mr. Ford Lamb that you already have 25 senior chapters and and 2 student chapters, the membership in these chapters varying from 90 to 550. That doesn't include the membership that lives in eight foreign countries and a chapter which will soon be set up in Canada. All in all there seem to be about 30,000 prospective members in this country alone. It must seem quite evident that so rapid a growth is due to the fact that there was a wide demand for just what you are now in position to furnish. In other words, it is due to a need which is now being met.

To keep in touch with the newest developments in our field is a big job in itself. There is a constant succession of new developments in machine tools, accessories and materials.

Importance of the Tool Engineer

The importance of the Tool Engineer is not limited to the service he renders to his own organization in safeguarding and increasing the profit margin. He is actually performing a job of national importance. We must realize the critical importance to this nation of securing a greater output for each worker employed in our industries, for that is the only fundamentally sound solution to our national problems.

There are a great many people who think that there is just so much work to be done. By the simple expedient of cutting our working hours in half, we would employ twice as many workers to do it. Cutting the work day in half reduces a man's income, but all we need do to offset that, they think, is to raise the hourly rate. The way to stimulate business according to this theory, is merely to let a lot of people have money which they are bound to spend. By their spending, they increase the need for manufactured articles and the result is reflected in every part of our industrial structure.

The one serious fault in that line of reasoning is the fact that these steps tend to increase costs. When you reduce the work day and increase the wage rate to compensate for this charge you are increasing the price of the thing you are manufacturing. Let no one delude himself with the idea that industry's profit margin is so wide that these additional costs can be absorbed. 1936 was a pretty good year, and it happens to be the last year for which records are available. Of 478,857 corporations which filed income tax returns for 1936, only 275,616 had any net incomes. These additional costs cannot and will not be absorbed. They are passed on to the ultimate consumer, but the ultimate consumer will not pay a higher price, and the cycle ends abruptly right there, for you cannot by legislation force people to buy when they don't want to do so.

Some time ago Mr. W. J. Cameron of the Ford Motor Company in one of his Sunday evening broadcasts suggested that we think of all of the goods produced in the United States as being put in one huge pile. All of us, then, must go to that pile for the things that we need. Obviously the more there is in that pile the more we can give to everyone. Any step that curtails production, that reduces the size of that pile, cannot but result in a reduced standard of living in this country.

Increasing Worker Output—Solution

The solution is obviously an increase of output per worker, for if he can produce more and better things in a given time, then we can leave the price of the article unchanged, yet can pay the worker a higher hourly rate, or if you please, give him a shorter work day, but you will note that the increase in wages, the decrease in working time, and the lowered price to the customer, must follow as a result of increased manufacturing efficiency. It is not possible arbitrarily to change wage rates and working hours first, and then hope that in some mysterious manner the manufacturer will find the money to invest in better equipment, or the enthusiasm to proceed in his task of securing the greater efficiency which is imperative if our industries are to continue.

This, then, is the critical importance of better machine tools and the critical importance of the work that our sales engineers, and you as Tool Engineers, are doing. Better manufacturing methods relieve the worker of strain and

(Continued on Page 34)

"REHABILITATION of IN
as an Aid to
RELIEVING ECONOMIC STRESS"

IN discussing a subject as broad as this and especially in times like this I believe it is necessary for us to analyze our problems most carefully and exchange opinions with others. It is helpful to check back on the history of what has been the outcome of such discussions and what organizations, such as the American Society of Tool Engineers, have accomplished by them.

It is an outstanding fact that through the discussion and the exchange of ideas by all kinds of engineering societies, research societies, personnel societies, cost accountants' organizations and others, remarkable accomplishments have been realized over a period of years in many lines of activity.

Seemingly there has been a necessity for meetings and discussions and any part that I have tried to take in them I have always considered important, not only in the fact that I was learning something myself, but that I might do or say something which would be a benefit to others. I do not believe that I have ever participated in any kind of an organization, or talked to an organization that I have not turned over in my mind the basis on which that organization originated.

Therefore, I have laid out this subject "Planned Maintenance and the Maintenance Budget," in several sections, as follows: Three M's of Industry—1, Men; 2, Material; 3, Money. A, B, C's of Industry—1, A—Accounting; 2, B—Budgets; 3, C—Costs and Control. Readjustment Periods: Why they have occurred; when they will occur again; what we can do to make them less severe each time they do occur. Stabilization and Control of Finance by Industrial Management as an Aid to Economic Distress. Equalization Budget or Equalization Reserve Account for Rehabilitation Purposes During Slack Periods.

3 M's of Industry
Men

1. In my judgment the most important thing that we are working for and must consider is MEN. All of our works and efforts must benefit man in his entirety, not only as to his general welfare, but, as to his advancement, standing in society, power of purchasing and wanting the better things of life from day to day.

This is certainly the fundamental principle on which everything is produced and developed. In order to bring this thought more clearly to your minds, I believe we must all acknowledge that we are responsible for bringing men into this world, educating them, seeing that they are taught to care about themselves, and everyone is anxious to have their families more advanced and have the finer things of life as they are produced and have been provided from time to time.

It takes a long time to develop men and in most cases they are raised from children to men 25 to 30 years old before they start producing and repaying their way to society. I do not know of anything that requires longer to develop and train into usefulness than our man power and especially so since we realize that a man is in his most useful period of life between 35 and 45 years of age.

Material

2. Materials are the natural elements which we work and develop into useful commodities and products for our use. A man who is scientifically trained to develop material in all its stages has been one of the most outstanding requirements of the present age. Regardless of the lost arts, as shown in ancient history, the present day scientists have developed materials far beyond the general expectations and with our present engineering and scientific developments along material lines we have accomplished wonders.

Some scientists have made the statement that the end of the world will only occur after all materials have been used up and that during approximately the last 100 years we have used more materials than in all of the previous history the world has recorded. However, with materials being developed for all the purposes which have been required by mankind, our materials have only recently been brought to their possibilities, while alloys of great strength, steel, concrete and a multiple of other elements are finding their own in the accomplishments of man for the world's use.

I do not think any of us need to worry about the end of the world from a material exhausting standpoint, although it has been found necessary on certain materials, to either substitute them or pass laws whereby they will be conserved for the future. On the other hand, radium is reputed to be the scarcest material which we know very much about and scientists claim that if there was a greater quantity of this particular element much more good could be done along certain lines.

You will note here that materials become as naught except for the importance of Man, whom I have captioned as the most important.

Money

3. Money is only a medium of exchange by which we progress and make exchanges, one with another, for our requirements, and is the means by which we exchange our values to each other.

However, it has been said that man's greatest fortune is his Health and Education. In this I agree to a certain extent, although I cannot imagine anything that would make a man more sick than to not have any money or any other value which would establish a good exchange basis for his labor and efforts to provide for him and his family's livelihood.

As I see our whole situation we are all trying to accumulate as much value of exchange as we possibly can and for this reason we are all working and coordinating together to accomplish the best results at all times. Therefore, I like to term this introductory as the background for our meeting and I consider them the "Three M's of Industry."

The "A, B, C's of Industry"
Accounting

A. Accounting is an instrument to management and with industrial corporations and mergers becoming larger every day, accounting is becoming one of the most important facts with which we have to deal.

Not so many years ago we never heard of one man being president of a billion dollar bank or one man being president of a manufacturing corporation employing 100,000 men. Today we have one President of the United States with its 130,000,000 people, so that you can readily see the importance of financial control of such vast undertakings.

The accountant today must be a bigger man, more responsible and reliable than ever before and on account of his findings, records and tabulations, things unheard of are being managed.

An accountant is really an assistant executive, or should be and he must actually record and furnish statements of all business transactions in terms of money, by which all commercial and productive activities are and can be measured. By the actual facts in his accounts, any business is managed and

DUSTRY

By E. C. BRANDT

these accounts must serve as a guide for successfully conducting the business.

A bookkeeper records the results of transactions which are the results of an operation or a business.

A cost man records and finds the details for making up and summarizing the costs. He is usually located down the line and closely associated with the processing, near the foreman or the workmen who are actually familiar with the production and cost, both productive and expense. In my judgment he is the important person on accounting matters as what he knows and does reflects into the general statements and accounts. Everything should be correct at its source and the cost man who knows what he is charging into a cost, knows it is right and knows why it is right, is the real instrument to management. In reality he is a cost engineer because he knows how to construct a cost and knows why the cost is right in his particular business with his own company's producing facilities. We do not have enough cost engineers, but, depend on bookkeepers. Men trained through the business as time study men usually make our best cost men.

Why do so many managers leave the matter of their costs and expenses up to undertrained men and clerks? In my judgment here is one place in any business where cheap undertrained men are too expensive. The field for highly trained cost engineers has been neglected.

During the last 35 years in which I have been connected with American Industry, I have never seen a cost which was too low. I believe all of us have heard costs, costs, costs from many angles, not only from the people from whom we buy, the people to whom we sell, the men who are producing the goods, the salesmen who are selling the goods and finally our management. Is there anything more important than costs?

There have been a great many different cost methods and systems. The cost method that was good enough a few years ago is out of date today and I can imagine that the most perfect cost system today will be out of date tomorrow. The cost system that will apply to one industry or one business may or may not apply to another. However, I believe the fact remains that the management of any industry is looking for a cost which covers all of the men, material and money expended in their business and after everything is paid for a profit will be realized whereby the owners of the business will receive their dividend and some money will be left for the continuance and operation of the business.

E. C. BRANDT
Sales Manager, Renewal Parts and Service, Westinghouse Electric and Manufacturing Company

Budgets

B. One of the surest ways that a profit will be realized and money will be available for dividends and the continuance of the business is by having history and facts of the overall expenditures so that the proper budgets can be laid out and definite controls realized.

These budgets must be laid out in such a way that definite amounts of money are provided for each item of material, manufacturing, selling and overall expenses and management must see to it that the proper men are held responsible for controlling these budgets.

Costs and Control

C. What is the right cost? I do not know. What is the best cost? I do not know.

Both of the above mentioned questions can only be analyzed and termed as cost control after the cost of anything has once been established, after having determined the article to be manufactured, the best location for such manufacturing, the best labor market for such manufacturing, the best material market for the part, the most economical design and engineering for the part, the best material price for the part and the best manufacturing equipment for making the part. When you finally have this cost realized with the best study and reasoning for this cost, you can term it as a standard cost, because it is taking into consideration the overall investment, material, defective work, defective material and the overall things which have been responsible for having it cost what it did. From this point you have a standard cost and a cost to control and any deviations from this must be termed cost variance, and the reason for such variances definitely established and corrected.

We can only feel satisfied that we have a good cost of any component detail or any assembly piece of apparatus or equipment when it can finally be sold to a satisfied user and a profit realized. The way of business has always seemed that when anyone is making a product and making money that some other progressive group starts making a similar product for the same purpose in another city or in another territory, at a lesser cost, and this immediately establishes competition. Then, we immediately start trying to meet this competition, analyzing the things all over again which we rightfully thought were good costs and under control, but, we find that competition has to be met and we go to work all over again.

Therefore, it is outstanding that competition has been the means by which we have progressed and have produced at a lesser cost and as I see the situation this turnover time and time again has been one of the things that has caused us to have territorial and national readjustment periods, although there are other outstanding reasons for depressions. Maintenance—Its necessity. Maintenance—Inspection and Prevention. Maintenance Equalization Budget. Maintenance — Expenditures. Rehabilitation—During volume variance periods.

It was stated by James G. Harbord in his address before the A.S.M.E., Dec. 7, 1933—"The average rate of expenditures for renewal parts and maintenance in normal years is $4,800,000,000 in America."

Today we have facts showing that the annual expenditures for replacement parts and maintenance, in normal years, is approximately $5,250,000,000, employing 6,500,000 to 7,000,000 men. Of this amount approximately $1,250,000,000 is on electrical apparatus and its application, employing 2,000,000 to 2,500,000 men.

Why Are Executives Thinking More About Their Maintenance Problems Today Than Ever Before?

What is prompting our trade periodicals to devoting more columns and giving over more space to this subject? What has been the cause for maintenance engineers and maintenance superintendents specializing on this important matter more than ever before? Why are Maintenance and Maintenance Budgets part of our University curriculums?

It was only a few years ago that the maintenance division of any city, company or corporation was looked upon only as an expense department and today it is being readily seen that it is one of the major saving departments. Any company's maintenance department will naturally depend on the size of the requirements, its location and the product which it manufactures. This also applies to our towns and cities, with their public works department and maintenance division and we should not forget the large buildings, bridges and dams which are being erected today.

I am merely mentioning these as it is becoming very outstanding that our industrialists through our different engineering societies, chambers of commerce, boards of trade, educational institutions, etc. are beginning to take more of an interest and know more about our city maintenance, what becomes of our tax dollars and how they are being spent. It is through our management organizations that the matter of budgets and costs and what is becoming of our dollars is being analyzed more carefully and being better controlled. People and society are demanding better and finer things every day; this is in line with our advancing educational system and is as it should be.

Show me a concern with a good maintenance department and I will show you a company that makes money—with a good plant, a better place in which to work and better workmen to produce a better product. Show me a company with run down buildings and equipment, dirty shop and a group of workmen who are negligent and I will show you a failure or one which will fail. I will show you a company that our bankers are not interested in and consider a poor financial risk.

Show me a city with good public works and a maintenance department and I will show you a city that has good homes, better people, with better industries and more luxuries. They will raise better children and you will see a city where people and industries will want to locate.

Today we are building finer factories, larger buildings, installing better equipment, have better workmen, pay higher wages and in fact are doing greater things in the promotion of American society and the general welfare of our populace as a whole.

Our laws are being built around just such a set-up and everything pertaining to the betterment of humanity is being promoted and realized. Safety laws have been passed, zoning laws are being enforced, fire rules and regulations are being enforced everywhere. Our Compensation laws are being enforced and with this in mind everything possible is being done to curtail accidents and a full realization of the safety of our people is being promoted.

I cannot appreciate any management who will neglect to properly maintain all of their properties and equipment nor any cities who are not properly maintaining their highways, bridges, sewers, streets, etc. and it is no longer a case where men can neglect these and permit a dangerous hazard to endanger the life and general welfare of its people.

With larger buildings and better equipment being installed one of the main items and consideration which is being analyzed now, is, what kind of maintenance will this property and equipment require? What will be the actual cost of this maintenance? This cost must be figured in the cost of the product and if maintenance is neglected, true costs are neglected and eventually larger bills and higher costs result. Therefore, as mentioned before, the maintenance department is no longer the expense department, but is the cost saving department.

Let us take our own personal properties as an example—our homes and our automobiles. If we do not keep our house painted, deterioration will take place and cost of repair will occur. Very few of us care to drive our car if it is defective. Therefore, we have it repaired and maintained to our comfort and the safety which is required by laws—if we don't, we will pay more.

Having been responsible for a large industrial plant's maintenance for a number of years, naturally, I have formed some very concrete opinions as to what our maintenance department was and what their responsibilities are. I feel that nothing should be left undone to accomplish the things expected of us.

A Maintenance Inspection Division in My Judgment is an Important Group in Any Maintenance Set-Up

Their main duty and thought is the prevention of maintenance. These inspectors are specialists in their particular line and it is their job to carefully inspect the buildings, light, heat and power facilities in every detail, including cranes, elevators, hoists, railroads, handling facilities, plant transportation equipment and everything that must be maintained.

When any deterioration is noted it is the inspector's duty to report this situation and see to it that the proper maintenance is made as early as possible and in this way the major expense of complete rebuilding or high maintenance costs are prevented. I am quite sure that with the installation of a maintenance inspection department, maintenance expense can be brought to a minimum. This is cost reduction.

A Works Engineering Department which has charge of plant planning and layouts, new building projects, architectural work, installation of all equipments, including both mechanical and electrical equipment, test floors, etc., knows definitely what is going into every new building, how it is being installed and what maintenance will be expected in a few years. They know if new projects are not properly installed and if extraordinary maintenance will occur.

Another outstanding item which is set-up through a Works Engineering Department is the adoption of standards and through this medium the minimum number of maintenance and renewal parts are brought about and naturally lower costs.

The superintendent of a maintenance division should make out a look-ahead budget and this should be reviewed annually for an appropriation which will be reviewed by the management and submitted to the executive organization for approval.

I believe the responsibility of a maintenance department can be very readily summed up in saying that it is their job to keep everything in good repairs, first class operating condition, see that good housekeeping is maintained throughout the entire plant and that large maintenance bills are not necessary. Also that the greatest economies are realized by constantly keeping after repairs of a minor nature.

A complete record should be kept of maintenance costs and maintenance superintendents must continue to make recommendations for replacement of the different units of equipment which they feel are inadequate and on which the maintenance costs are considered too high.

It is also the maintenance superintendent's duty to know of the latest and best equipments which are offered for different purposes and to make recommendations to the management and the production superintendents along this line. Maintenance costs play a large part in the rehabilitation and replacement program.

Most companies believe in good buildings, good equipment, good workmen and a good product. When good housekeeping and modern facilities are provided and a good place for our men to work, then we consider it a pleasure to show our many customers and friends

our factories—their condition and what we are doing in them.

At this particular time, due to the economic conditions of not only the United States, but, the entire World, this subject is very appropriate and I think worthy of not only this Association's consideration and discussion, but, for all American Industries.

The facts which present themselves are the necessity for better maintenance on everything we own and possess. As I travel throughout the country it is outstanding the courage men have had in establishing the wonderful buildings, railroads, factories, bridges, highways, automobiles and all of the finer things of life to which the American people are entitled through the evolution of materials, scientific developments, engineering, progress and fulfillment of demands and wants of the higher and ever increasing educated people.

It is therefore, a fact that we not only appropriate money for capital accounts and constructing all of these mammoth projects but realize that sooner or later we must provide expense money for their maintenance to minimize the deterioration and erosion which is bound to occur with everything that exists.

However, scientific developments of materials have increased their wear and life to such an extent that past costs of maintenance in everything cannot be very well used as the standard for the present or a look ahead for the future.

When we consider the courage that many of us have had in establishing all of these things, we wonder where our courage now lies in the maintenance and continuance of these things which we all enjoy and which are a necessity for the subsistence of life and the hope of continuing prosperity and advancement.

During the last 20 years we have not only educated ourselves, but, we are now educating our children with more stringent educational laws, making it compulsory that each child go to school. Through this art we have been trained and educated to want and keep on wanting the finer things of life until we obtain them.

I am not willing to admit, although we are coming out of the worst readjustment period we have ever been in as a Nation and as a World, that we have lost our courage, but, as I see the situation we are taking a complete inventory of our entire conditions and can only hope to come out of this readjustment period a better Nation, with better facilities, better maintenance, better education and as a whole a Nation looking forward to better times and prosperity.

Rehabilitating America

I believe that America will have to be rehabilitated and the things we now possess repaired and properly maintained before other expansion will be made or is a necessity.

Since we have all had the matter of expenses so embedded in our minds by our past several years' experiences, rehabilitation and maintenance is one of the main subjects of the day, not only from our Government's standpoint, our Corporations' standpoint, factories, railroads, etc., but our homes. America while standing idle the past few years has been wearing out. Therefore, financial budgets on the most economical maintenance program are in order.

All of the things which we possess have been built and constructed on capital accounts and the maintenance of all of these possessions will be rebuilt and maintained on expense accounts. With the guard which has been placed upon this type of expenditure by private enterprises it is going to require the best that is in all of us to have it realized.

I am not going to burden you with a lot of figures and statistics along the lines of budgets for maintenance operations as I do not know of any set of figures or tabulations which would suit each and every property's singular condition and the deviations which control or establish the amounts of money required for each property or facility is different according to the following:

What is the age of the present existing facilities?

What is the type of structure of the present buildings?

How have the present buildings and facilities been maintained in the past?

What grade of materials and workmanship were used when they were originally constructed?

What has been developed and produced for a greater output along manufacturing facility lines to obtain lower costs and better manufacturing conditions?

What has the immediate future to offer for the same equipment for producing at a lower cost?

What competition is to be met in the location where your present facilities are in existence?

Are your facilities capable of meeting lower costs and competition?

All of these things must be very thoroughly analyzed and the proper people come to a common conclusion as to what is the best procedure for establishing a budget for such maintenance and rehabilitation and carefully analyze and look into the future.

I Have Never Seen a Cost That Was Too Low

Every cost is too high. We have heard from our managers, engineers, economists, sales managers and our customers that the costs must be reduced and I do not know of anything that we have all worked harder on and we will have to continue to work hard on, than to continue to reduce not only manufacturing costs, but, maintenance costs.

In my experience the best way to arrive at the best cost, with the facilities at hand is to establish a budget or something to definitely shoot at and this is the main object in establishing and having a budget of any kind.

Stabilization and control of finance by management as a cure for economic distress. Equalization budget or equalization reserve account for rehabilitation and maintenance during slack periods.

I am one of the last men who would ever want to take away the initiative of any man or any company, but, I do believe that history must be our best teacher. We have had depressions before and we are going to have them again and from history we must learn to provide ways and means to make them less severe each time they occur.

I also believe that certain readjustment periods are a healthy condition as they not only give each of us a chance to take an inventory of ourselves, but to take an inventory of our business, an inventory of the future and analyze our conditions as to general structure and stability for continuance.

While these inventories are being taken, ways and means could be provided whereby they could be termed Rehabilitation Periods instead of depressions and panics and as I see this overall situation this can only be accomplished through stabilization and control of finance, through equalization budgets and the establishing of equalization reserve accounts.

I do not know any more substantial organization to lay this problem before than our Educational Institutions, nor do I know anything more critical to the progress of any Industrial Nation than to see one industry after another having two or three months of poor business and having to close up shop, negotiate loans, and find themselves in a bad way because the control of finance has not been properly administered or managed.

It might be well for us as individuals to take some recognition of how through our own personal efforts, the efforts of our outstanding insurance societies, promotion of pension funds, etc., which provide for a rainy day, and apply this same practical principle to the operation of our business—whereby we would have the material things for the continuance of our operations on a somewhat lesser scale, but, still progressive and thereby eliminating the unemployment, suffering of humanity, local and national welfares and other things detrimental to society.

Most every business either large or small has certain accounts and expenditures which have to be met in addition to the purchasing of their raw material, men's wages, etc. and the following accounts have to be reckoned with:

Material Cost, Operating Wages

Miscellaneous Salaries and Wages

Supervision

General Factory Supervision
Superintendents and General Foreman
Foremen and Assistants
Time Study Men
Inspectors

Clerical Labor

Supervisory Staff, Inc. Superintendents Clerks
Production Clerks
Paymaster

Other Labor
Crane and Elevator Operators
Oilers, Cleaners and Porters
Material Handlers
Miscellaneous Wages
Sub Tool Room Expense
Pay of Stores Stock Men

Shop Supplies
Fuel, Water and Refrigeration
Stationery and Office Supplies
Miscellaneous Shop Supplies

Shop Losses
Defective Workmanship
Defective Purchased Material
Other Losses Due to Errors

Rendered Service
Stores, Receiving and Returned Material Departments
Shipping and Traffic Departments
Power Purchased and Generated
Police Service
Maintenance & Operation of Railways
Purchasing Department
Other Service
Employment Department
Relief Department
Works Accounting Division

Miscellaneous Factory Expenses
Rearrangement of Equipment
Welfare, Inc. Vacations of Hourly Employees
Accident Compensation
Instructors and Learners
Unapplied Productive Labor and Material
Unassigned Freight and Express
Other Miscellaneous Factory Expenses
Loss on Short Ends, Etc.
Maintenance of Patterns
Restaurants and Dormitories

Fixed Charges
Fire Insurance and Taxes
Building Depreciation and Rentals
Depreciation of Machinery and Tools

Maintenance of Land, Buildings, and Building Equipment
Wiring and Lighting Equipment
Buildings and Structures, Roadways and Grounds
Heating, Ventilating and Piping Equipment

Maintenance of Machinery, Tools & Fixtures
Machine Tools, Motors and Foundations
Hand Tools and Mechanical Equipment
Machining Tools
Handling and Testing Equipment, Forges, Furnaces, Etc.
Furniture and Fixtures

Why Is It Not Possible to Establish Equalization Budgets and Equalization Reserve Accounts for Rehabilitation Purposes During Slack Periods?

In my judgment this can be taken care of by establishing a small percentage to the accounts coming under the captions of "Maintenance of Land, Buildings, and Building Equipment" and "Maintenance of Machinery, Tools and Fixtures" which are the things that wear out rapidly during the peaks of production and which we know will eventually have to be replaced the same as they have been replaced in the past. However, for some reason or other when demand of products is the highest, expansion, over-production and over-expansion has been made and when business falls off from the regular line of manufactured product our expenses are not curtailed accordingly.

Therefore, I believe that an equalization reserve account is in order for every progressive manufacturing establishment and if this could be put across nationally then we would welcome readjustment periods whereby our facilities could be rehabilitated and not look forward to them with sudden dread and disaster to our nation.

This can only be done by Managers establishing such reserves and then sticking strictly to the purpose for which this money was provided and not use this reserve for taking care of other unforeseen financial conditions.

There will be periods when some industries will need financial help and with all their facilities, such as buildings, grounds, manufacturing equipment, etc., in good operating condition will be more inviting for our bankers to review and will create a greater possibility for securing the financial aid which they may require.

If our buildings, grounds and manufacturing equipment are in a run down, poorly kept and worn out condition we cannot expect the sympathy of our bankers and the possibilities are that they will not be interested in supporting our financial requirements.

There are many American industries which are producing seasonable products and where this occurs you will find a successful management of this type who operates their facilities at full capacity during these periods and provides rehabilitation money for maintenance of equipment and putting their plant in A-1 condition for the next season's output. For example, automobile plants, canneries, furnaces, steel, glass, etc.

I cannot see any other principle that is as sound for our overall situation and in looking over our American industrial Activity Chart since 1854 I find that we have had approximately 18 periods of prosperity or those periods above normal and approximately 16 periods of depression or those periods below normal. The years of prosperity have varied from 1 to 5 years while the periods of depression have varied from 1 to 8 years.

The first thing we notice is that inquiries for quoting on our product have slackened somewhat, we notice that orders are not developing, we notice that manufacturing is letting up somewhat, we notice that our stocks and inventories are rising somewhat, and there is an indication that buying has ceased.

We wonder if we are getting into a slackening up period, some men may start to ask if we are going into another depression. Others are more optimistic and say this is only a little lull in our own particular business, but, we must remember that there are thousands of manufacturers who may be experiencing this same thing.

We immediately start to inquire of our sales and field service men what is occurring, most of them say that it doesn't amount to much, except that this customer and that customer have held up buying just temporarily and that the salesman has not actually lost the

(Continued on Page 28)

The Figures Below Are Not Actual But Only Laid Out as an Example

OPERATING EXPENSES

TABULATION OF ALLOWABLE EXPENSES VS. VOLUME VARIANCE

Account	Allowance	Percent of Activity 30%	40%	50%	60%	70%	80%	90%	Normal 100%
1. General Factory Supervision	Monthly $600	600	600	600	600	600	600	600	
2. Superintendent and General Foreman	400	400	600	750	750	750	750	750	
3. Foremen and Assistants	800	1200	1600	1800	2000	2000	2000	2000	
4. Time Study Men	400	600	800	800	800	1000	1000	1000	
5. Inspectors	800	1200	1600	1800	2000	2000	2000	2000	
6. Clerical Labor—Give more in detail—See List	400	800	1200	1600	1700	1800	2000	2000	
7. Other Expense Labor—Give more in detail—See List	400	500	600	700	800	900	1000	1000	
8. Shop Supplies—Give more in detail—See List	100	150	200	250	300	350	400	400	
9. Shop Losses	50	50	60	70	80	90	100	110	
10. Rendered Service—Give more in detail—See List	1000	1000	1200	1200	1400	1400	1600	1600	
11. Miscellaneous Factory Expenses—Give more in detail—See List	2000	2000	2000	4000	4000	4000	5000	5000	
12. Fixed Charges—See List	5000	5000	5000	5500	5500	5500	6000	6000	
*13. Maintenance of Land, Building and Equipment	4000	4000	4000	4000	4000	4500	5000	5000	
*14. Maintenance of Machinery, Tools and Fixtures	8000	8000	8000	8000	8000	8500	8500	9000	

* Money provided in Equalization Budget as described.

Under 50% production load is the most economical maintenance period or while shop is half idle on production.

CHAPTER DOINGS

By GEO. J. (Jitter) KELLER

OVER two hundred members and guests from **Racine**, Milwaukee, Kenosha, Madison, Rockford, Chicago and from other points in the middle west, attended the fourth Annual Frolic and Banquet of the Racine Chapter held at Meadowbrook Country Club, Friday afternoon, June 9th. Though it rained all afternoon, one hundred golfers played eighteen holes in the blind bogey tournament. Other outdoor games consisted of slow pitch ball, egg throwing contests, running games, etc. Prizes were distributed immediately after the dinner. Not a member or guest left without a prize. Thanks to Adolph Zabrowsky's Prize Committee. E. W. Dickett of Rockford, second Vice-President of the Society, George Johnson, Chairman of the Rockford Chapter, Forrest McGuire, executive secretary of the Racine Manufacturers Association and Joe Elwood, Chairman of the local Chapter, gave short talks at the banquet. Tex Reynolds of the Racine Journal Times was the toastmaster. Entertainment was provided by Everett Williamson, local vocal soloist who led the community singing. The frolic marked the end of a season of technical sessions, which this year have attracted more than one thousand persons engaged in Tool Engineering and processing on many products.

The **Cleveland** Chapter held its last meeting of the current season at the Cleveland Yacht Club, thanks to Skipper Ray St. John, who made the arrangements. Following the dinner the landlubbers were escorted around the island by St. John and Bill Warrander who explained some of the finer things about boats. About sixty members attended the meeting and a number of them brought their friends along. It was good to hear that Tom Fraser and his membership committee were on the job and turned in several new applications for membership. (Tom should, he sold your editor an idea once.) The Entertainment Committee was on the job and despite the fact that there will be no meetings in the summer months, they have already planned several outings and get-togethers for members and their families. The first one will be in July on which the plans are now in progress and notices will be sent out.

The **Bridgeport** Chapter held their June meeting at the Bullard Cafeteria. They voted to have a tool show in Bridgeport in February or March, 1940. Ross T. Phipps, of Bullard, has consented to take charge of the show with several ASTEers for his committee.—Give it a boost, Boys—Before the group was taken through the Plant, E. P. Blanchard gave a brief description of what they would see and learn regarding Bullard machines. Each unit of 8 members and guide toured the plant and were interested in what they saw. After the tour refreshments were served by members of the entertainment committee, Fred Ahlbin and Fred Miller of the Underwood Company. Where was their Chairman, Ross Foothorop . . . and what has become of Ed. Ebelhare. Chas. Granniss of the Carboloy Co. was on hand and met all the boys . . come again. . ditto for George Cunningham, now will you miss the meetings.

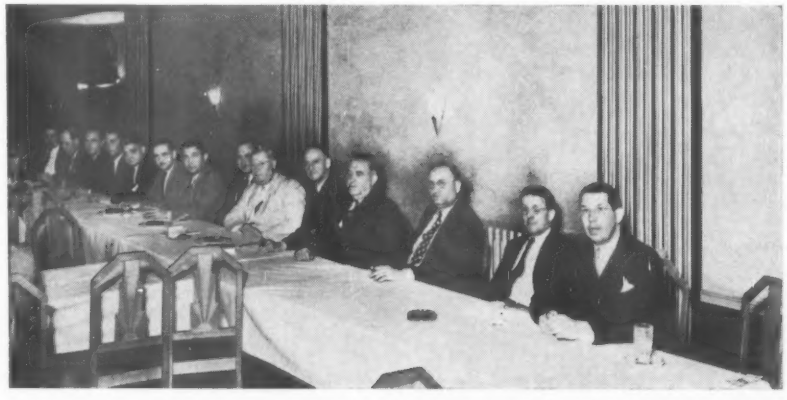
Toledo Chapter culminated its meetings for the season with a technical session at the Toledo Yacht Club, June 6th. R. T. Keller and A. M. Swigert, Chrysler Motors Corp., gave very interesting talks on the subject of "Superfinish." The speakers were showered with questions for over an hour and everybody enjoyed the whole affair. Their next session will be in September, and that means that there will be plenty of fish stories tossed back and forth when the boys get together again.

The regular meeting of the **St. Louis** Chapter was held at the York Hotel June 1st. 72 members and friends enjoyed the fried chicken. Chairman Doogan is planning to have certain senior members take it upon themselves to act as counsellors to the Junior members and any others who may wish it. He will sit with the man assigned to him and introduce him to the rest of the members, have him join in any shop talk, explain what the conversation is about, have him ask any questions he may wish, if he cannot answer the question see that he is brought into contact with someone who can give him the correct answer. In the plan it is expected to give a helping hand to the Junior member and help him to increase his knowledge, making him more self-confident and in turn making him more valuable to his employer.* A good lecture was given by Francis Trecker on "A New Development in the Art of Tool and Die Milling." The lecture was full of good information and many ideas were picked up by those present. The date of their second annual outing was set at July 15th. This will be strictly stag and an all day affair with barbecue chicken and the trimmings that go with it. Also plenty of liquid that makes a certain city famous but it will be made in St. Louis which is also famous for this kind of product. (We will not take our hats off to any city when it comes to making a good liquid product—so says St. Louis.) The place will be a private club on the banks of the muddy Missouri River about 35 miles west of the city. There will be trap shooting, rifle and pistol shooting, baseball, horse shoes, etc. Prizes for all winners in the contests. A handsome loving cup designed by their Chairman and made by their good member, Hank Rebesberger, was shown to the members. This will be known as the Chairman's cup and will be given to someone for his proficiency in some game or sport. That to be announced later. Any ASTEer who will be in St. Louis that date will find a royal welcome and in leaving will say he had a good time. Sounds great—St. Louis—but it's a long walk.

Dayton Chapter was the guest of the Frigidaire Corp. at Morain City on Monday, June 12th. Dinner was served to the members in the plant cafeteria after which a plant tour was made. M. M. Roberts, Plant Superintendent, spoke on "The Philosophy of Work." A lively

(*Ed. Note. Other Chapters please take note.)

(Continued on page 18)



Worcester Chapter No. 25 was chartered June 12th. Seated at the head table, reading from left to right are: A. B. Reed, Chairman of Standards—Worcester Chapter; C. J. Lindegren, Treasurer—Worcester Chapter; C. A. Banks, Secretary—Worcester Chapter; H. G. MacDuff, Chairman of Membership—Worcester Chapter; G. S. Gould, Chairman of Editorials—Worcester Chapter; L. A. Goff, Chairman of Publicity—Worcester Chapter; R. H. Morris, Chairman—Hartford Chapter; E. M. Taylor, Chairman—Worcester Chapter; H. W. Dunbar, Guest Speaker—Vice President Norton Company; A. H. Starrett, Toastmaster—Chairman of Meetings, Worcester Chapter; I. S. Holland, National Director—American Society of Tool Engineers; R. A. Cole, Vice Chairman—Worcester Chapter; E. Walker, Chairman of Industrial Relations—Worcester Chapter; W. J. Long, Chairman of Entertainment—Worcester Chapter.

CHAPTER DOINGS

(Continued from Page 17)

discussion was held which touched on politics, the depression, the foreign situation and social security. A short business meeting was held and an announcement made for the first outdoor meeting to be held at Secretary Walter Olt's farm, July 10th. A fish fry, baseball, and card games are promised, with the feature of the evening to be a true or false contest between sales engineers and tool designers. The annual dinner meeting held in May saw 123 members and friends turn out at the Gibbons Hotel. Ten industrial exhibits drew the attention of everyone present. The entertainment committee hit a new high with various types of entertainers from an accordionist, singers, radio entertainers, magicians, with President Johnson having his head dehydrated. (Approximately a pint and a half of water was removed from his cranium.) The featured speaker was Lieut. L. A. Sorenson, Asst. head of the Procurement Division of the Ohio, Kentucky and Tennessee area, who spoke on "The Place of the Tool Engineer in Case of a National Emergency."

Well, folks, **Hartford** Chapter wound up a highly successful season with their annual spring outing held at the Rockledge Country Club on May 23rd. About 300 turned out to enjoy a sports program of golf, horse shoes, dart throwing and putting contests. An exhibition match was played between a foursome of the top notch golfers in the state and a driving contest for non golfers furnished amusement for everyone. The high spot of the afternoon, however, was a triple play in the soft ball game between the peddlers and the pencil pushers and the break neck activity of the boys to get to third base where a cooling drink awaited those who made it. They were glad to welcome their guests, Jim Weaver, National President, H. B. Hall, Chairman of New York-New Jersey Chapter and Ben Brosheer, Sec. of New York-New Jersey Chapter. A. H. d'Arcambal, National First Vice President was honored with a testimonal dinner in the evening, at which he was presented with a gift by the executive committee. Door prizes and gifts were provided for others attending.

New York-New Jersey Chapter held its June 13th meeting in the R.C.A. Building, Radio City, New York and thereby saved their New York and Brooklyn members from crossing two or three rivers and travelling many miles out into Jersey in order to attend. This was the first time that the group staged a technical session in the big city. The occasion was a symposium on press die design and construction and it brought out over 300 members and guests. Louis Pickett of the Reliable Tool Company, Irving, New Jersey led off by describing and exhibiting some unusual shaving dies that his company has built. He was followed by Joseph Clocke, Chief Die Engineer of the E. W. Bliss Company, Brooklyn, whose talk was along more general lines relating to die design and press operations. W. P. Powers, Secretary U. S. Tool Company, Ampere, New Jersey closed the symposium with a discussion on the multi-slide machines made by his company. Movies were shown of the machines in action and Mr. Powers also exhibited some of the work performed by them. Frank Malhiot was introduced as the new Chairman of the membership committee. Wallie Gray, program chairman, has the programs for the next season sewed up, except for June, 1940. Ralph Flanders, president of Jones and Lamson Machine Company, will address the opening meeting in September. The October session will be a joint meeting with the New Jersey Section of A.S.M. Tom Orchard promises another golf tournament and stag outing on Sept. 16th at "The Knolls," one of the finest courses in Northern New Jersey. Andy Scharfenberger, ticket chairman, gave a sales talk. Over 40 Wright Aero ASTEers came by bus from Paterson. The Jerseyites make up 66% of the Chapter membership and supported this meeting in great shape.

Two hundred and thirty-five members and friends of the **Cincinnati** Chapter enjoyed a fine program at the first anniversary dinner and exhibition, Hotel Alms ballroom, June 6th. Twenty-two

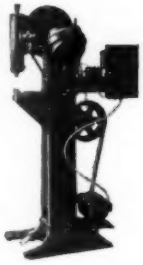
(Continued on Page 20)

TOMKINS JOHNSON

products . . .

the RIVITOR—for automatically feeding and setting solid rivets in automotive parts—clutch plates, seat racks, window frames; in cooking utensils—coffee pots, percolators, dripolators, shears, knives, can openers; in containers—oil and paint cans, garbage cans, cement pails; in sleds, skates, toys—production riveting of all kinds—obtaining a stronger joint, better—faster.

the CLINCHOR—for automatically feeding and setting clinch nuts in automotive body panel sections, door locks—and set as fast as the operator can feed the work to the machine. May be tooled for "D", "Case" or "Extruded" type clinch nuts. A Machine—not an attachment for a punch press—increasing production from three to five times—definitely minimizing spoilage.



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Write for details to The TOMKINS-JOHNSON CO., 624 N. Mechanic Street, Jackson, Michigan, or get in touch with our representative in your territory. Boston—Gen. Mach. Corp. . . . Buffalo—R. C. Neal Co. Inc. . . . Chicago—H. F. Wolnick Mach. Co. . . . Cleveland—S. G. Morris . . . Denver—Edward C. Swan . . . Detroit—Haberkorn & Wood . . . Grand Rapids—Joseph Monahan . . . Hartford—Geo. M. Pearse, Jr. . . . Indianapolis—Henry G. Hoss . . . Milwaukee—J. M. Grimstad . . . Newark—George M. Pearse . . . Philadelphia—W. A. Rankin (Drexel Hill) . . . Pittsburgh—J. A. Bouslough . . . Rochester—R. C. Neal Co. Inc. . . . San Francisco—R. W. Conroy . . . Syracuse—R. C. Neal Co. Inc. . . . Canada—Geo. T. White Co. (Walkerville, Ont.) . . . Europe—Gaston E. Marbaix, Ltd., London, England.

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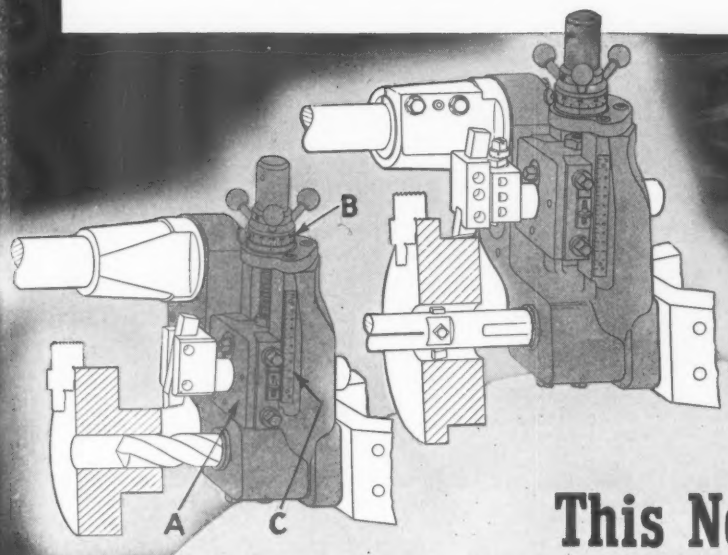

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You can adjust the turning cutter to size as though it were on the cross slide. The holder, held in an adjustable block (A) is quickly set to size, using the large graduated dial (B). To change from job to job simply move block up or down, with measurements controlled by pointer and scale (C). Both dial and scale show changes in work diameters, and micrometer dial quickly provides final, accurate adjustment.

You can combine turning and boring cuts by using boring bar in center hole while turning cut is taken, as shown above. Large, heavy duty turning cutters are set with minimum overhang and maximum support, due to adjustable block mounting—an ideal set-up for carbide turning.

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This new Tool Catalog and Manual, covering the most complete and modern line of turret lathe tools in the world, will be sent on request.

CHAPTER DOINGS

(Continued from Page 18)

companies exhibited their products. Dinner was served at 6:30 after which National President Weaver gave the opening address, outlining the progress and future plans of the society. The second speaker, the Honorable James G. Stewart, Mayor of Cincinnati, made humorous comparisons between the Royal Order of the Garter and Tool Engineers. A serious appeal was made to all Tool Engineers to work in harmony with their associates to further good will and to promote good fellowship in business. Our own Art Pletz impersonated Baron Von Blitz and gave a historical review of famous characters including Betty Revere and Paul Ross. George Seyler, Works Manager, Lunkenheimer Company, gave an address on "Where the Tool Engineer Fits In." Howard Upham, Prize Committee Chairman distributed 16 prizes and souvenirs donated by various companies and friends of the local chapter. Several barrels of beer served with many songs led by an attractive (?) accordion player was the final act. Hats off to Lou Weber and his committee for such an enjoyable evening.

New York-New Jersey Speakers Club show off before wives. Starting in Herb Hall's sitting room last December, the speakers class of the New York-New Jersey Chapter advanced to the point where it was able to throw a successful party on June 5th at King's Tavern, Newark. About thirty-five were present and wives were invited so the members could demonstrate that their excuse for taking Monday nights off had not been a phony but for the cause of self improvement. The wives were soon on their feet proving that the women always have the last word. What a banquet it was with the ladies present, the printed menu, the pre-dinner cocktail, the after-dinner beer and so on—far into the night. Herb Hall, Chapter Chairman did a swell job as toastmaster, introducing class officers and about everyone else with a wise crack for everyone. A one minute dissertation by each male member on the proposition that two could or could not live as cheaply as one, was the feature of the evening. Prize for the most original answer went to Wilson Ryno who insisted they could. (Love always finds a way.) There was a contest for the ladies and they wrote their answers naming the attributes of a good husband. Four tied for first place and Mrs. Hall won the draw. (What do you mean "draw." Was it a fight?) This speakers class is going places and an active program is planned for the fall under the same officers consisting of Chairman Bob Kindt; Vice Chairman Bob Crannell; Secretary, Bob Dillon; Recording Secretary, Bill Herbert; Treasurer, Frank Malhiot and so the speakers class go Bob, Bob "Bobbing" along.

The newly formed **Worcester** Chapter, heard Howard W. Dunbar, Vice President of the Norton Company in an off-the-record account of his recent trip to Japan at a meeting in Hotel Aurora, Worcester, June 12th. Nearly one hundred attended. Ray Morris, member of the Hartford Chapter spoke on their activities and Irwin Holland, representing the national chapter discussed broader issues of The Society. Fifteen applications for membership were received. The next meeting of the chapter will be held in September. Chapter officers are: Edward M. Taylor, Chairman; Raymond Cole, Vice Chairman; Charles A. Banks, Secretary; and Carl J. Lindegren, Treasurer. The membership includes engineers employed in Worcester Industries.

Tell Berna of the National Machine Tool Builders Association, speaking on "The Tool Engineer and The Machine Tool Industry" and E. C. Brandt of Westinghouse Electric & Mfg. Co. speaking on "Rehabilitation of Industry as an Aid to Relieving Economic Distress" spoke to five New York State Chapters during the week of June 12th. They started on Monday at Buffalo speaking before a capacity crowd. One hundred and eighty attended dinner and about two hundred heard the lectures. President Jim Weaver attended, Ed. Schwannhausser of Worthington Pump & Machinery Corp. was Toastmaster. Buffalo Engineering Society, A.S.M.E., S.A.E., and the Electrical League co-operated in making this meeting a success. This winds up the season for the Buffalo

(Continued on Page 34)

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Manufactured in 9", 11", 13", 14½" and 16" swing; 3' to 12' bed lengths; Quick Change Gear and Standard Change Gear types; Countershaft and Motor Drive. Write for a copy of General Catalog No. 98.
Immediate Delivery can be made on popular sizes from dealer display stocks in principal cities, a few of which are listed below. Write for name of dealer nearest you.
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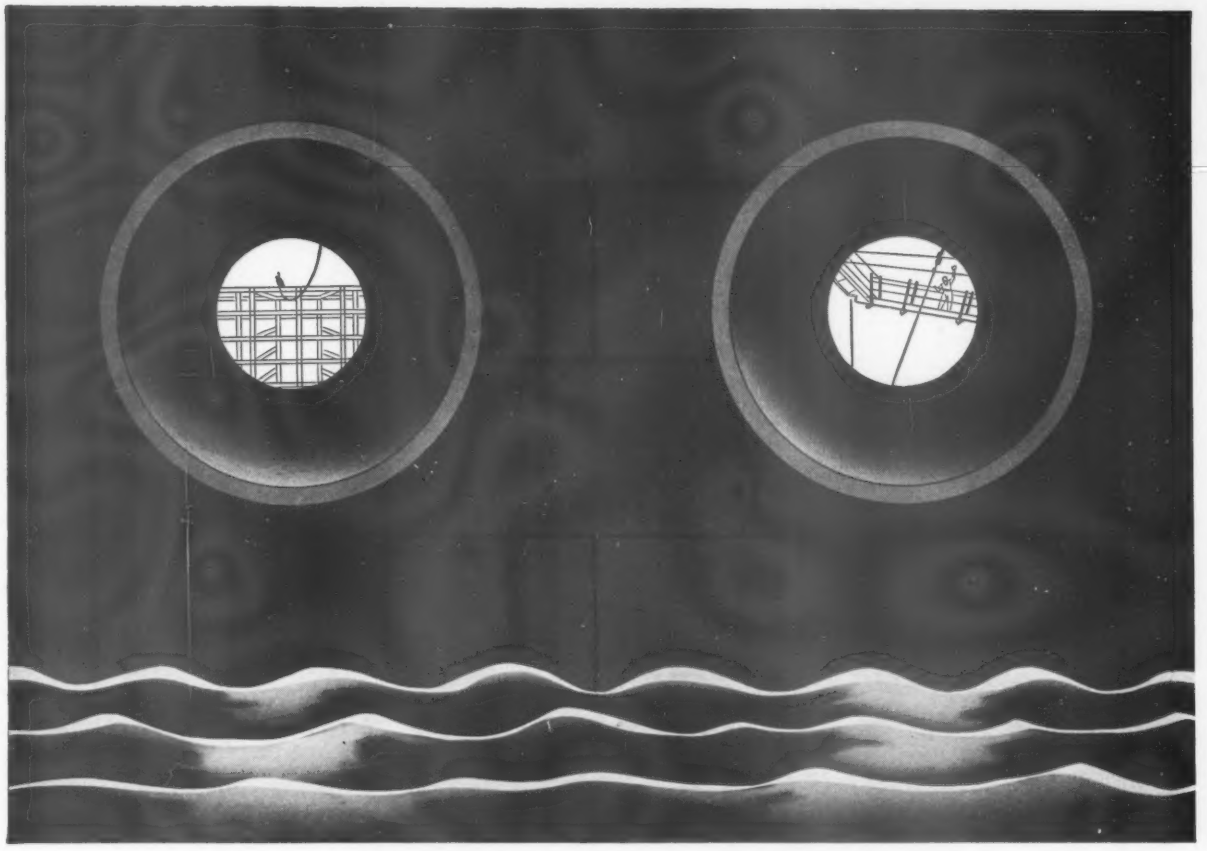

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All this plus the ability to withstand the corrosion of water containing sulphuric acid from mine drainage.

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MOLY

Handy Andy Says —

Summer is here again and, forgetting tools (when we can) we turn to golf and lakeside, or, as more productive recreation, to the garden plot. For ourselves, we diversify our program, leaving the serious side of life with a touch of human interest. In this connection, I sometimes wonder if reminiscence is worthwhile (if you only knew how hard it is to think up things to write about at times!) but, there come letters, and personal comments showing that a responsive chord has been touched. One thought stirs another, and after all, experiences are seldom personal, being usually shared with someone else. If you don't believe it, tell your own story sometime and see how quickly an incident clicks in a circle of friends. "I shot an arrow into the air"—like the song and the story it fell to earth.

▼ ▼ ▼

Some of our readers may recall that, last summer, I wrote a tale of a wild ride from the lake in the small hours of the morning, beating the stork by a bare margin. Now, just to satisfy our Fact Finding Committee that my writings have tangible foundation, I depose and say that the package the bird brought in is the winsome little daughter of A.S.T.Eer Len Johnson and Mrs. Len, of whom you are bound to hear sooner or later in spite of his quiet modesty, is one of O. B. Jones' prodigies and, incidentally, a protege of mine who is doing very nicely by everybody. You should see what he fathered! Me, I call her Willikin, meaning little goddess of things as they ought to be. Long life and happiness, Carolyn; may your future be as bright as your big blue eyes.

▼ ▼ ▼

During the depression (not the "recession") when many of the best of us were "out" through no fault of our own, I took to free lancing, somehow managing to keep the wolf at bay in spite of thinning soles and bank holidays—holidays!—the while I tried for a fresh toe hold on the ladder. My bridges were burned behind me, the concern where I had worked nine years having folded up, so there wasn't even hope of reemployment. Fought, bitterly, a sense of futility, a feeling that brains and training were simply liabilities. Then, a break!—an ad for tool designers. Answered it, to my surprise met Chuck Sweeney, with whom I had worked some ten years earlier and at the time "chiefing" at Swartz Tool Products. Chuck, since gone to meet the Chief of Chiefs, took me on, and with that the tide turned. Swartz, as you know, is one of our consistent advertisers, a fine and friendly concern to work for and a reliable and brainy outfit whose reputation for results is traditional. Pete Dubois, likeable A.S.T.Eer, now sits in the Tool Engineer's chair at Swartz. Greetings, Pete—and best regards to the gang.

Between Swartz, M. A. Atlas' Engineering Service and Al Sargent's Pioneers I was kept busy enough for a year or two, eventually connecting with a job that afforded broader scope. Somehow, I like the roar and clank of the shop, mainly because I dislike noise and try to find ways to quiet things down. Like the lazy man who works like the dickens to make life easier. Anyway, the depression was an experience not always to the liking of men who take joy in working and getting things done, but, there were compensations. Perhaps we needed it, to renew the starch in us; certainly plenty of the boys came out of it the better for having refused to take a licking. Personally, I made some fine friends, besides finding an outlet for surplus energy in this A.S.T.E. This Society, by the way, is about one of the best things that came out of the depression.

▼ ▼ ▼

A correspondent is undecided whether to pity or envy a body with a memory like mine. I wonder. For instance, you go back to the old home town after a lapse of years, hunt up your bosom pal of boyhood days and stretch out the glad hand. He puzzles for a while, then brightens. "Oh yeh, I remember you now, I think." It has happened to me, and what a deflation of egol At that, memory runs in

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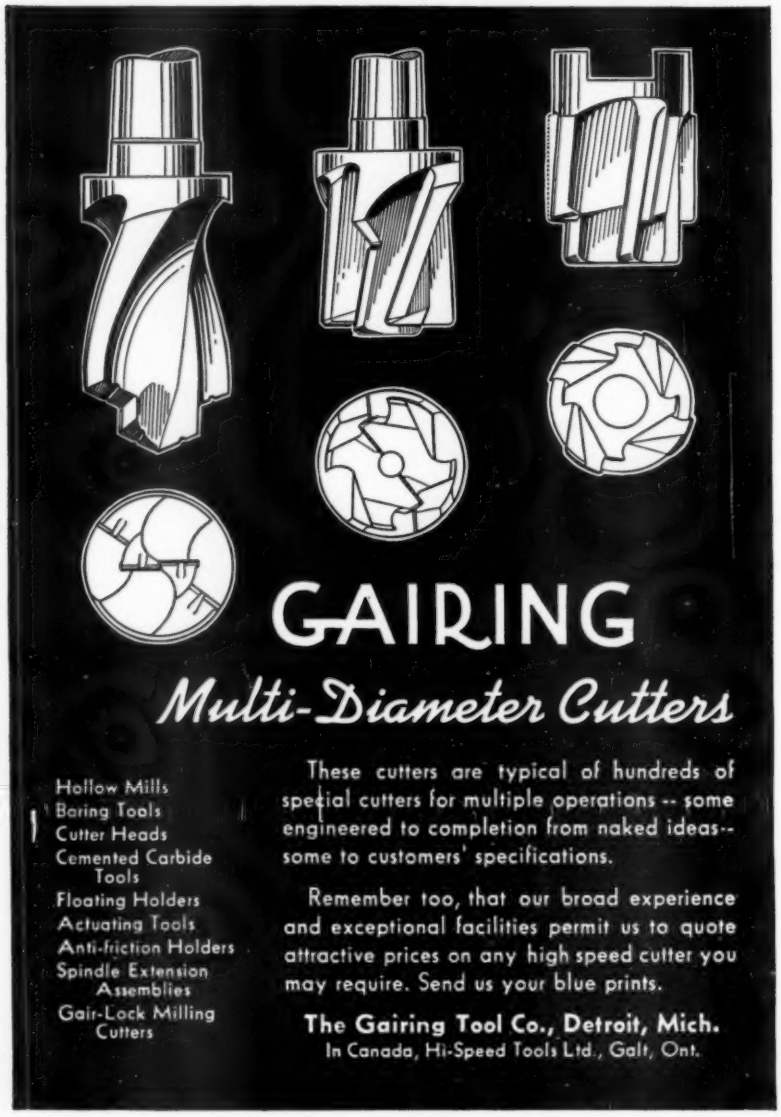
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Gair-Lock Milling Cutters
These cutters are typical of hundreds of special cutters for multiple operations -- some engineered to completion from naked ideas -- some to customers' specifications.
Remember too, that our broad experience and exceptional facilities permit us to quote attractive prices on any high speed cutter you may require. Send us your blue prints.
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SPECIALISTS IN FINE CUTTING TOOLS FOR 21 YEARS

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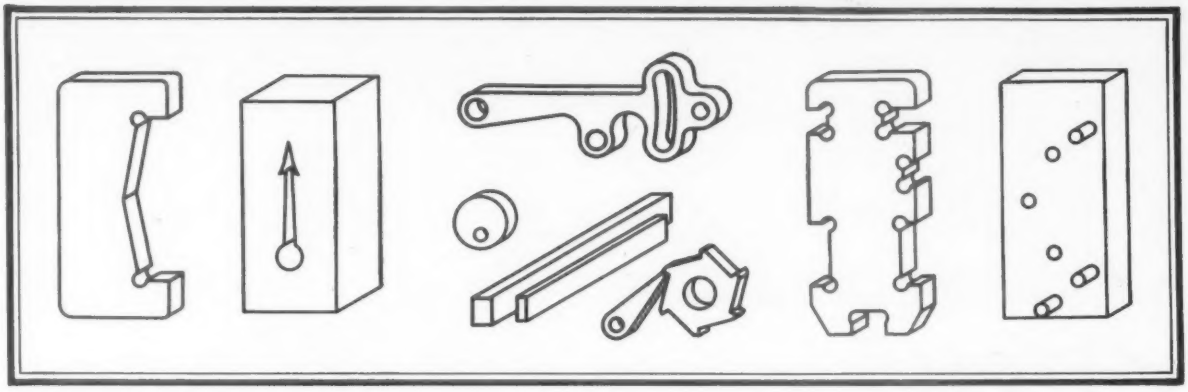

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STARRETT TOOLS
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HANDY ANDY SAYS

(Continued from Page 22)

grooves; I can recall almost any incident in my life, not in flashes, but as a movie endowed with life. The twinkle of an eye and the flash of a smile are as indelibly recorded as the frown; the rustle of leaves in the breeze, the crunch of lichen under foot, the warmth of sunshine and the cool damp of night are connected with the scenes, as are the smells of sea and lakeside, the freshness of country and the mustiness of city. If I could only remember names and to mail the wife's letters!

▼ ▼ ▼

I recall when, a tad of four, the family fortunes gone by the board and my father dying, I was taken from the hills of Vermland to the plains of central Sweden. My father stood there, tall and bearded, having come to see me off, beside him, my mother, a diminutive cameo on the station platform; seated beside me, in the coach, my grandfather, red flannel undershirt peeping from beneath his cuffs. Then, strangest of things, the people on the platform. the station itself and the terrain all began to slide away! I caught a glimpse of my mother, smiling through her tears, of my father, waving a last farewell, and it took some time before it dawned on me that the train was moving, not the landscape. Then a blank, as of a film blurring out, next, regarding with puzzlement a blank wall of fog that suddenly lifted and revealed, not the wonted hills but a broad expanse of lake that just stretched on and on without end. With that lake, and the little red farmhouse that stood by it, are etched some of the sweetest memories of my life.

▼ ▼ ▼

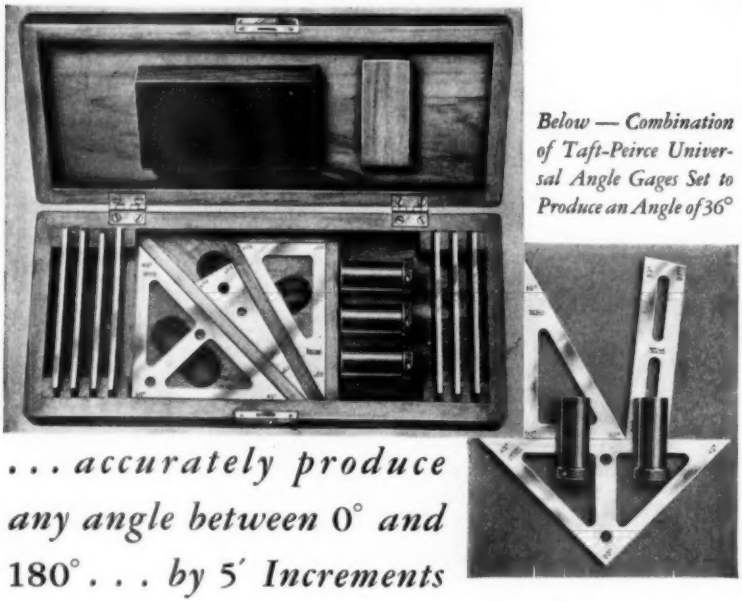
There comes, whirring now as memory quickens, the departure for America, where—as Mor Britta said—the streets were paved with gold. Up betides on a crisp morning, miles of jogging behind a bay horse, the click of rails and a clattering roar over bridges, then, the wallowing roll of a Wilson liner across the North Sea. A kaleidescopic flash of England, then the broad Atlantic on a ship so big it was just unbelievable. Days and days of it, up the rigging and down in the engine room, where I was finally accepted (since I wouldn't stay out) to gaze in wonder at the polished giant that drove us westward. The lure of exotic American fruits, disillusionment when a jocular galley swab tendered a red hot pepper! The lights of New York!—a jewelled fairyland but, in retrospect, no brighter than the winter stars that twinkled crisply over the little farmstead. Oh yes, I'd like to go back, even as you to the scenes of your boyhood, but "to wander, a stranger, the paths he had known, and lament the mem'ry of days that have flown." No I'll stay here, this is my land. The streets of America may not be paved with gold but "thar's gold in them thar hills" if a fellow will dig. May we Tool Engineers pool our resources to the end that the goose that lays the golden egg be kept happily honking. Best wishes for vacation time, A.S.T.Eers everywhere. In October, we meet in Cleveland. Happy landings.

Handy Andy

New

TAFT-PEIRCE

UNIVERSAL ANGLE GAGES



Below — Combination of Taft-Peirce Universal Angle Gages Set to Produce an Angle of 36°

. . . accurately produce any angle between 0° and 180° . . . by 5′ Increments

Applied directly to the work—without any obstruction—this new set of patented universal angle gages marks a definite improvement over protractors or other means of measuring and laying out angles.

The complete set shown, comprises 10 independent angle gages . . . 7 of which are parallel blades with a pair of supplementary angles on each end . . . and 3 of which are triangles. The universal angle members are fixed in combination for convenient handling and use by an ingenious clamping device, 3 of which are provided in each set, as shown. All gages are made of tool steel, hardened and precision-ground so that variation from exact angle of any combination will not exceed 1′.

A set of Taft-Peirce Universal Angle Gages will be highly useful in toolrooms, die shops, manufacturing and inspection departments, for laying out and checking all angles. Each set packed in hard wood case, complete with instructions. *WRITE FOR PRICES.*

THE TAFT-PEIRCE MFG. CO.

Woonsocket T P *Rhode Island*

Woodworth Announces New Company

N. A. Woodworth, formerly President of Ex-Cell-O Corporation, announces the forming of his new company, to be known as "N. A. Woodworth Co." and located at 9111 Schaefer Highway, Detroit, Michigan.

Asscciated with Mr. Woodworth are: Mr. E. W. LaMonte, formerly of Swartz Tool Products Company, and Mr. J. F. Benner, formerly of Partool Machine Company.

The N. A. Woodworth Co. has acquired the plant and facilities of the Partool Machine Company. This plant is approximately two years old and is of modern design and construction, containing approximately 15,000 square feet of manufacturing space.

South Bend, Birmingham, Atlanta and Texas to Have A.S.T.E. Chapters

More new chapters of the A.S.T.E. are in formation as Tool Engineers in all sections of the country are learning of the American Society of Tool Engineers, what it is and what it has already accomplished. In all of the above-mentioned cities chapters are being organized, while in Texas several cities may combine to form a "Texas Chapter."

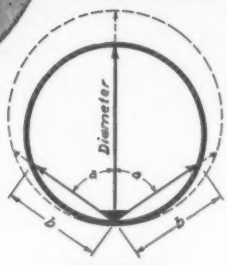
Now—there is a positive way to check bores.

SELF-LOCATING AND SENSITIVE CONTACTS

Three fixed, but adjustable locating points locate the two measuring points diametrically and perpendicularly with the cylinder. Centralization is assured for any diameter throughout the range of the gauge.

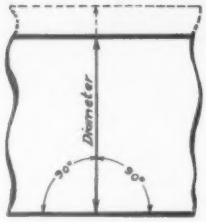
RANGE

2⅞" to 5" Diam.
5" to 10" Diam.



POSITIVE CENTRALIZATION

Angles "a" are always equal. Distance "b," on all three locating points (only two show in diagram), are set equal in definite relation to required diameter.



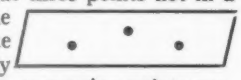
POSITIVE PERPENDICULAR LOCATION

Two of the three locating points locate the diameter measuring points at right angles to the cylinder walls. The third point locates it on the cylinder surface.

Positive Location of the Measuring Points in Relation to the Cylinder Walls Assures Positive Measurement of True Diameter

Comparing dimensions with precision requires definite location points from which to measure. But, cylinders, bores, rings and similar details present a real problem in determining such location points definitely.

The Model 1200 Cylinder Gauge is basically designed to overcome this indefinite condition. Its method of positive location is based upon the geometrical axiom that three points not in a straight line define a plane. The three adjustable locating points of the Model 1200 are all set at an equal distance "b" which has a definite relation to the true diameter. These points locate the gauge positively in relation to the cylinder wall and definitely locate the position of the *measuring* points perpendicular to the cylinder's axis and diametrically across the circumference. (See above diagrams.)



Creepage, scoring, and distortion of cylinder wall are eliminated. Contact is sensitive—because internal friction is eliminated. The motion of the sensitive contact is transmitted to the indicator directly through a rod which is suspended by a flat spring and a bellows spring. There is no lever or bell-crank bearing to cause error, and no opportunity for wear.

Demonstration quickly convinces one of the gauge's fidelity in repetitive readings. Write for particulars to—

Locating contacts are set directly in relation to the nominal diameter.

FEDERAL PRODUCTS CORP., 1144 EDDY STREET, PROVIDENCE, RHODE ISLAND

FEDERAL

It's quicker to use a Dial Indicator

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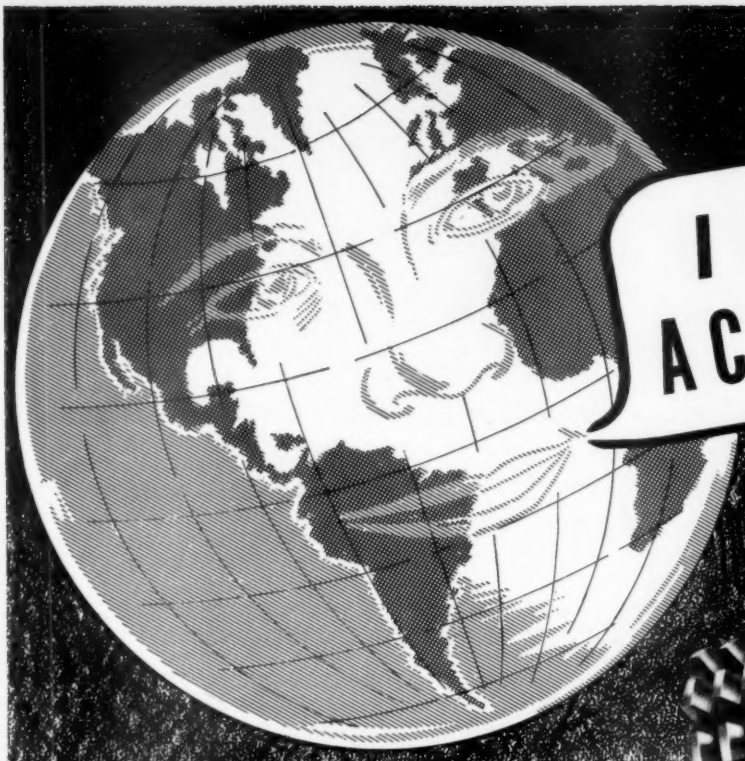
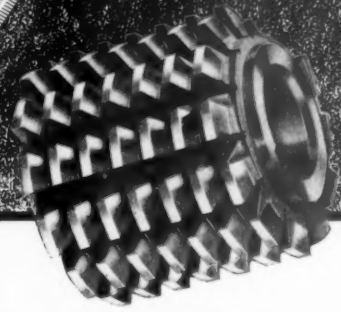


I Found ACCURACY!



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Ground Hobs Are ACCURACY

Barber-Colman creates Ground Hobs for a world demanding extremely accurate tools . . . hobs unexcelled in precision, fine finish, cutting capacity and long-run economy for commercial service. Barber-Colman Hobs are designed by experienced hobbing engineers; made exclusively by carefully trained craftsmen employing specially developed methods and machines; are rigidly inspected. Steels and heat-treatments are specified to suit particular hobbing conditions exactly. Every element of tooth form and helix is precise; can be duplicated any time. As both builders and extensive users of hobbing equipment, Barber-Colman Company is uniquely prepared to manufacture hobs, to render advice and service. Consult our engineers. Use Barber-Colman Ground Hobs in your most exacting work.

● Barber-Colman Unground Hobs provide equal satisfaction and economy for ordinary work. Investigate.

BARBER B-C COLMAN

PRODUCTS

HOBS, HOBBING MACHINES, HOB SHARPENING MACHINES, REAMERS, REAMER SHARPENING MACHINES, MILLING CUTTERS, SPECIAL TOOLS

BARBER-COLMAN COMPANY

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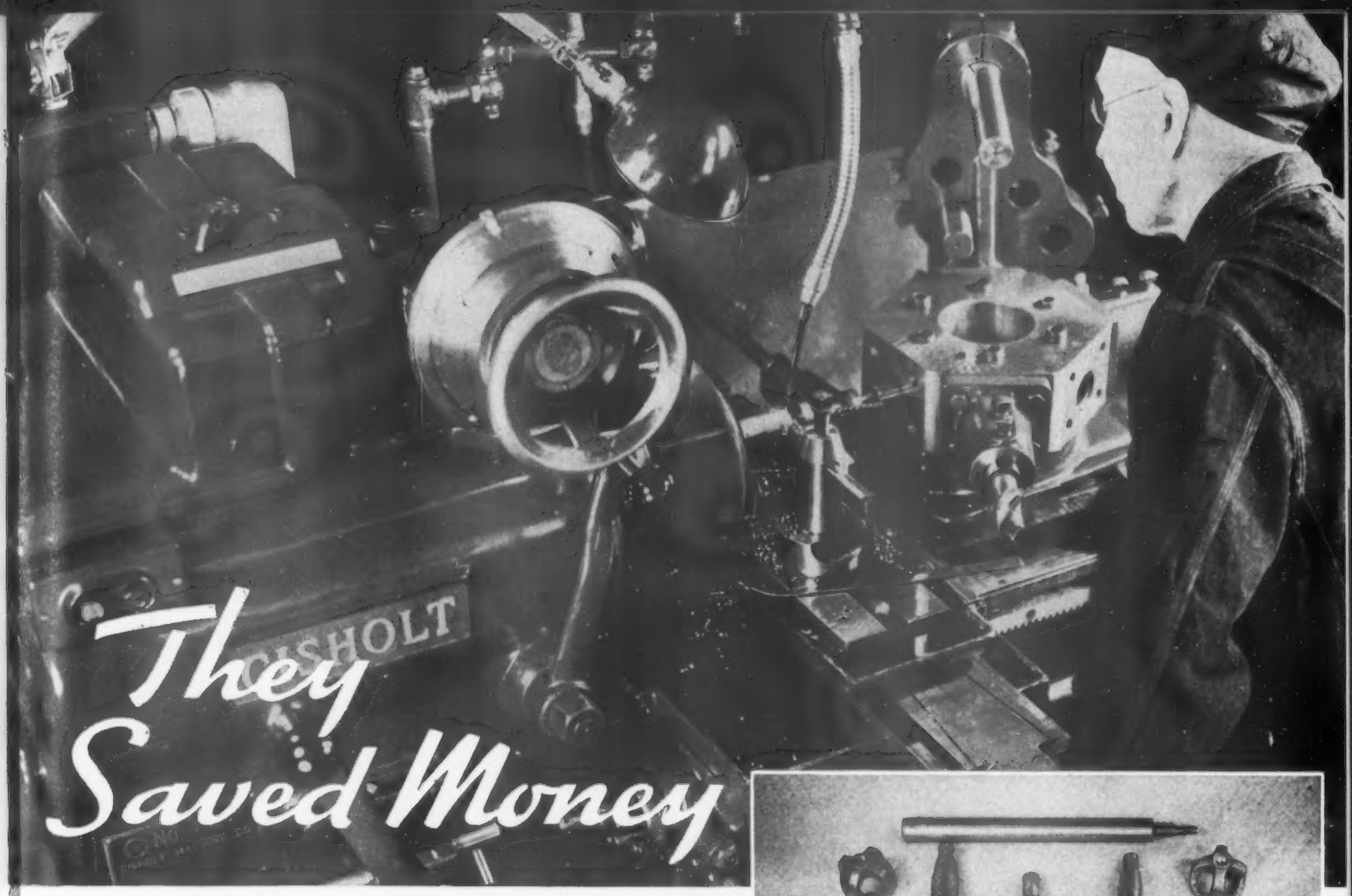
CLEVELAND, OHIO
Barber-Colman Company
3030 Euclid Avenue

DETROIT, MICHIGAN
Hodges Machinery Company
101 East Baltimore Avenue

MILWAUKEE, WISCONSIN
Dumser & Schroeder
610 West Michigan St.



They Saved Money

on This Kind of Work with the *GISHOLT SPEED SELECTOR*

UNIT machining costs are no less important on the small lot jobs than on the big ones—but they *are* more difficult to reduce. In this shop, on numerous parts made of steel, bronze, cast iron, cold rolled bar stock, etc., they found how to do it—with the Gisholt No. 4 Ram-type Universal Turret Lathe, equipped with the Speed Selector.

The speed and accuracy of this machine, with the simple pre-selection of various spindle speeds, saved 30% on this class of work. That's a lot when parts come in small quantities! On larger volume, Gisholt machines, equipped with Speed Selectors, are cutting costs as much as 30%, 40% and 50%, and even more. If you want savings like these, ask about the Gisholt Speed Selector.

The Gisholt Speed Selector is the simplest, most efficient control ever devised for providing selective, automatic speed changing. All speed changes may be made without stopping the spindle or releasing the main drive clutch. The operator merely sets a dial to the diameter of the cut and the machine automatically shifts to the proper speed.

★

This bulletin describes the Gisholt Speed Selector and its application on various types of work.

If you haven't a copy, ask for it now.

"YOUR SMARTEST INVESTMENT TODAY—BETTER MACHINE TOOLS"

GISHOLT
MACHINE COMPANY

1229 EAST WASHINGTON AVENUE, MADISON, WISCONSIN, U. S.

TURRET LATHES · AUTOMATIC LATHES · TOOL GRINDERS · BALANCING MACHINES

REHABILITATION

(Continued from Page 16)

business, but, he expects to close the deal in a few days or a few weeks. These few weeks go by and the business is still not closed and the same story repeats itself.

This happens in many territories and in a few more lines of business and continues to occur for six months or a year and we find ourselves in a subnormal period.

History shows us that from these occurrences have developed depressions from many angles. It is then that management begins to wonder what to do on account of the volume variance which their particular line is realizing.

The establishing of equalization budgets would maintain our organization and keep us operating by spending some of the surplus created for readjustment periods. It is obvious that this would curtail severe reductions, layoffs, unemployment, etc. and we would have money available to continue purchasing, our men would still be earning money and continuing to purchase and in this way the volume variance would be held to a minimum.

This process must be accepted nationally and if one company's volume variance after another continues, then there is only one thing to expect and that is the below normal period and the possibilities of drifting into a depression.

In the control of manufacturing expenses with volume variance it is absolutely necessary that we take all of the mentioned expense accounts and know approximately what percentage of our manufacturing cost each one of these expenses should be at normal production periods, and maintain these same ratios with our volume variance.

This should be recognized and realized by management and will continue down the line of his entire supervisory organization which to me means one of the greatest instruments to management in preventing everyone becoming panicky and provides the necessary accounts and facts for scientifically managing any business.

It provides the instrument whereby expenses are adjusted gradually to meet declining volume, it also provides the instrument for gradually increasing volume. It gives the supervisory forces not only the ratio of expenses to manufacturing cost, but, gives them the information that management wants them to have so they can become a more important factor in management.

Remember at this point that the foreman or divisional supervisor down the line who is not becoming a better man every day, knowing more about his costs and expense control will not be good enough to supervise America tomorrow. Nor will this type of supervisor be able to replace the men higher up, who are learning how to control and prevent depressions and below normal manufacturing periods.

Taking all of the expense items as given you, herewith. they should be tabulated in numerical order and following this should be listed the normal amount of expense for each item for any particular class of manufacturing or business. This should be ratioed on a percentage basis as to the percentage of volume variance of the business. In the chart I have started at 30% and gone to 100%, laying out the definite dollar and cents which would be permissible with a certain volume variance.

You will note, however, that some of these accounts, such as Accounts No. 1 and No. 2, General Factory Supervision, are not readjusted even though 30 to 100% volume is available as this group of managers can manage 100 men or 5000 men.

However, this does not hold true with all classes of these expenses and you will note that a great many of the other accounts vary in a certain percentage with the percent of activity, depending absolutely on the analysis or the kind of business which is being charted.

These figures and tabulations are only given to more clearly lay out this type of expense control with volume variance. The greater detail in which factory expenses can be laid out, in the name of the expense, with the coordinating number and broken down into different divisions or costing centers,

(Continued on Page 30)

The TRANSPARENT
SOLUTIONS
MADE POSSIBLE BY
"Stuart's
CODOL"
Liquid Grinding Compound
INSURE BETTER WORKMANSHIP
Phone or write today for Free Working Sample and 24 page booklet describing this highly recommended modern grinding lubricant.
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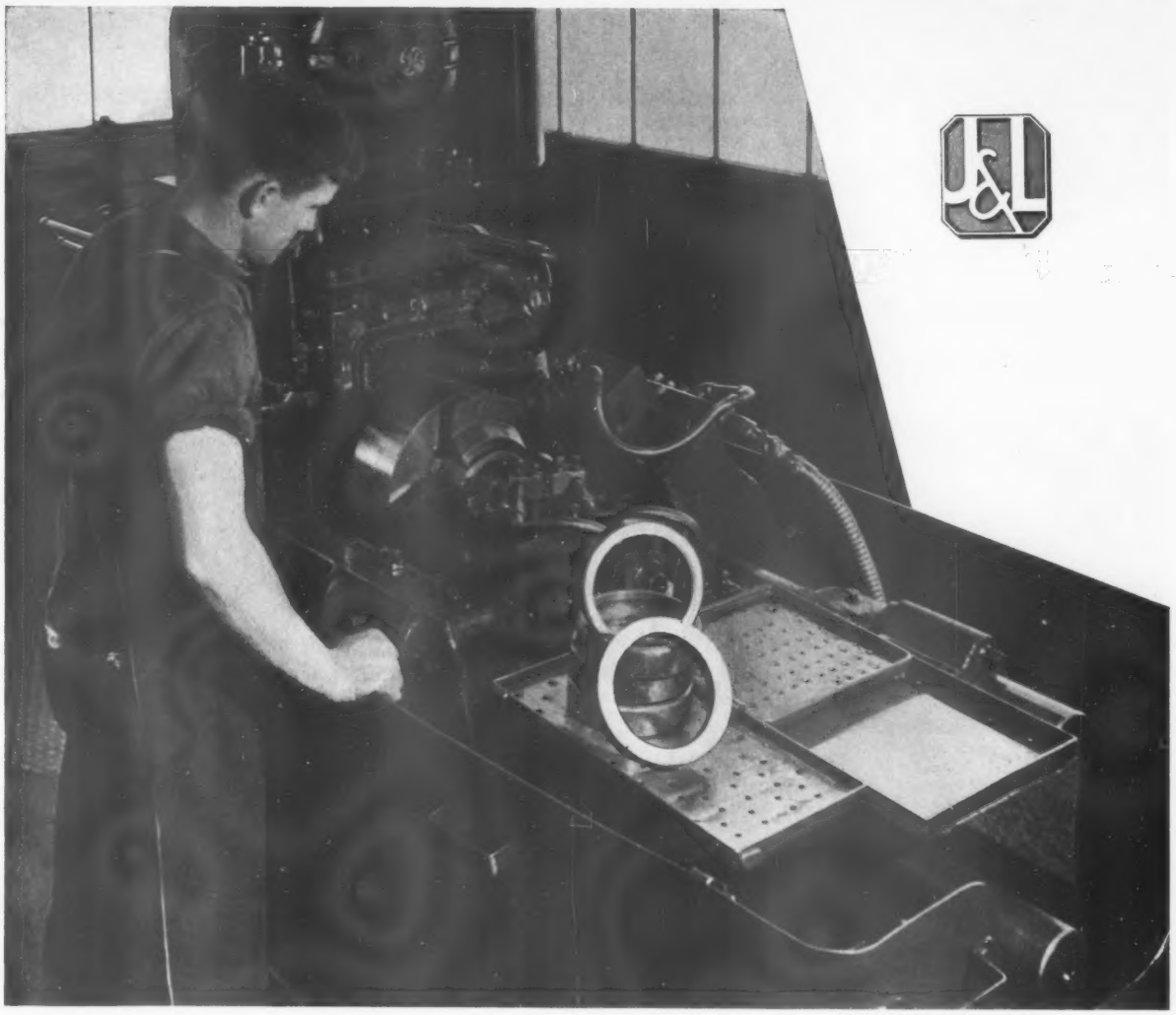
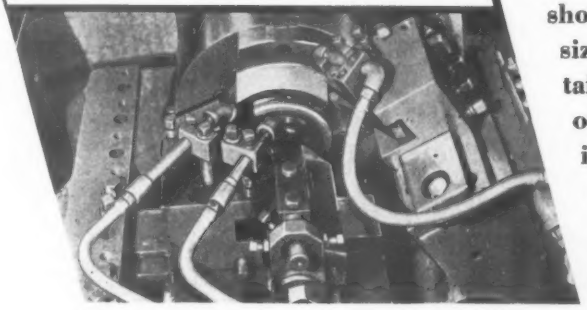
Warehouses in Principal Industrial Centers

Watch for "STUART OILS" in operation at Cleveland Machine Tool Show!



BIGGER PROFITS ON SMALLER LOTS



PROGRESSIVE bearing manufacturers have turned to the Fay for bigger profits on small lots of bearing races. This production problem is solved on the Fay because advanced design has made it *a standard machine for special work.* The 12″ Fay Automatic Lathe, shown, was designed to handle several sizes of bearing races—this design retains all the Fay features of quick change-over, rigid tool mounting, and convenient operation. . . . If your lathe work consists of producing small lots of bearing races, gear blanks, shafts, and similar pieces, it will pay to submit blue prints to our engineering department. . . . .

JONES & LAMSON MACHINE CO., SPRINGFIELD, VERMONT, U.S.A.

REHABILITATION

(Continued from Page 28)

the greater benefit will be derived, as it places the expense control, versus volume variance under the supervisors who are directly responsible for incurring the expense.

You will note a percentage of these accounts maintain certain salaries and fixed expenses at 30% of activity and when any business drops below that 30% point that business is evidently in a depression condition and it warrants a reduction of salaries, demotion of supervisory forces, and what we term "drastic action" in our industrial financial control.

Has America Learned a Lesson?

I am in hopes that America has learned enough from history of the past panics and will take advantage of finance and expense control in the future to prevent business as a whole from dropping to 30% of normal. I am in hopes that it will never drop below 65 to 70% which is enough fluctuation to satisfy most anyone. If we can maintain 75% of normal and only fluctuate 25% from normal we would be one of the most successful industrial nations and would have one of the most wonderful conditions that we could desire.

Of course I realize to ever obtain such proportions, a great many things which are not being controlled, would have to be controlled. This is especially true when we stop to think of the number of businesses which are practically closed during this present readjustment period and a great many of us may be asking ourselves—is it on account of over production, too many people in the same business, a supply greater than the demand, inefficient management and 101 other reasons, but, as time goes on we must study and work hard to prevent such things reoccurring.

I, as an individual, could not hope to put such a program across nationally, but, I do hope that I am submitting something that is sound and economical for your Society whereby it will be an instrument of management and control in times of economic distress and an effective control of maintenance expenses with volume variance.

Accounting for Maintenance Equalization Program

General—It is the purpose of the maintenance equalization program to standardize, over a period of say 10 years, the amount of extraordinary maintenance expense budgeted in the Indirect Manufacturing Expense rates and to make charges to current operations consistent with the productive activity for the period.

Limitations of Plan—The maintenance equalization program applies to extraordinary repairs to "Buildings and Structures" and the complete overhauling and rehabilitation of "Durable Equipment."

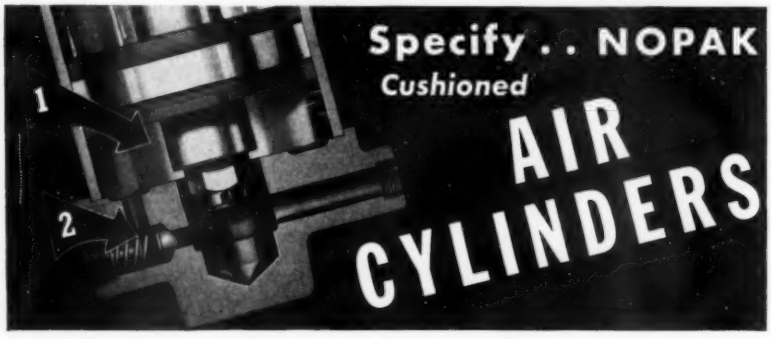
Basis of Accrual—At each works, accrual rates shall be determined by listing specific items of expense to be included in the program. The period of accrual of recurrence for each individual item shall be determined. The normal monthly accrual for each item shall be obtained by dividing the amount of expense estimated for that item by the accrual period in months. The total normal monthly accrual shall be computed by summarizing the accruals for the individual items.

Budgeting Accrual—Accrual for maintenance equalization shall be budgeted in indirect manufacturing expense identified to a special account, "Provision for maintenance equalizaiton" and included in Indirect Manufacturing Expense.

Where the maintenance of "Buildings and Structures" is supervised by a central maintenance department, the items covered by this account shall be budgeted and identified as "General Plant Expense." In all other cases the accrual for buildings and structures shall be budgeted as a divisional or departmental expense as the case may be.

The accrual for complete overhaul and rehabilitation of "Durable Equipment" shall be budgeted in plant, divisional or departmental expenses depending

(Continued on Page 36)



Sectional View Non-Adjustable Cushion Head

1 Non-Adjustable Air Cushion eliminates destructive shock and vibration at low cost.

2 Quick-Opening Air Duct assures quick starting under full power.

Available in Six Standard Mountings

• ***for Low Maintenance Costs . . .***

ALL NOPAK Air Cylinders are *Air Cushioned*. That means no metal-to-metal impact, no noisy, damaging piston hammering! Life of pistons and cup leathers is p-r-o-l-o-n-g-e-d: maintenance costs of cylinder and entire working assembly are cut down!

• ***for Minimum Air Loss . . .***

Self-sealing packing of special composition, on both rods and cups, utilizes air-pressure to *prevent air escapement*. This feature makes frequent gland-nut adjustment unnecessary . . . reduces air leakage to a minimum!

These benefits are *yours* whether you specify NOPAK Air Cylinders with *adjustable cushion heads*, or the new type *non-adjustable cushion heads*, illustrated above. The latter sell in the same price range as non-cushioned cylinders which they are rapidly replacing.

Write for latest bulletin.

GALLAND-HENNING MANUFACTURING CO.

2757 S. 31st Street
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NOPAK VALVES and CYLINDERS

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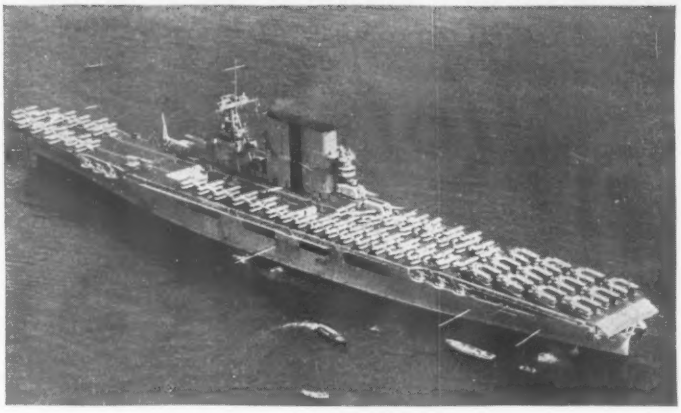
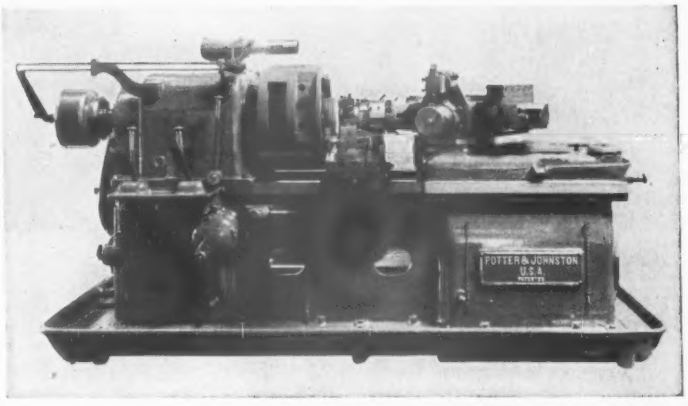
THE EYES OF THE FLEET POWERED WITH DEPENDABLE ENGINES



AMERICAN AND OVERSEAS PREMIER AIRCRAFT ENGINE MANUFACTURERS EMPLOYING POTTER & JOHNSTON AUTOMATICS ACHIEVE UNBEATABLE RESULTS

Machining problems arise in the Aircraft Industry which are peculiar and numerous. More often than not, they include a combination of alloy steels—large amounts of stock to be removed—many involved operations on one piece—high hardness readings — usually close limits of accuracy — extremely fine finish requirements—all of which call for not only a versatile and economical machine tool, but considerable cooperation between the manufacturer and the machine tool builder. P. & J. Automatics have proven outstanding for solving the problems for this class of work. They are especially designed for high production, with versatile tooling facilities.



POTTER & JOHNSTON MACHINE CO.

PAWTUCKET, R. I.

FACTORY REPRESENTATIVES: William L. Martin, Headquarters at Factory: New England States and Eastern New York & New Jersey: A. W. Stone, 986 Kenyon Ave., Plainfield, N. J.; Western New York & New Jersey, Eastern Pennsylvania, Maryland and Delaware; G. Tell DuBois, 8-154 General Motors Building, Detroit, Michigan; Michigan and the City of Toledo, Ohio; Louis K. Voelk, 14014 Woodworth Road, East Cleveland, Ohio; Ohio—with the exception of Toledo, and Western Pennsylvania; Harry L. Schuster, 743 North Fourth Street, Milwaukee, Wisconsin; Illinois, Missouri, Wisconsin, Iowa and Indiana. **AGENCIES:** Star Machinery Company, 1741 First St., South, Seattle, Washington; Henes-Morgan Machinery Co., 2026 Santa Fe Ave., Los Angeles, Calif.; Jenison Machinery Co., 20th & Tennessee Sts., San Francisco; Wessendorff, Nelms & Co., Inc., 317 Preston Ave., Houston, Texas; Arthur Jackson Machine Tool Co., 60 Front Street West, Toronto 2, Ontario, Canada; Arthur Jackson Machine Tool Co., 437 Grosvenor Ave., Montreal, Canada; Burton, Griffiths & Co., Ltd., Birmingham, England; R. S. Stokvis et Fils, Paris, France; Rotterdam, Holland; and Brussels, Belgium; Maskinaktiebolaget Karlebo, Stockholm 1, Sweden; Ing. Ercole Vaghi, Milano, Italy; Yamataka & Co.; Ltd., Tokyo, Japan (Imperial Export Co., 44 Whitehall St., New York, N. Y.); Almacoa, Zurich, Switzerland; Be-Te-Ha, Warchau, Poland; Schuchardt et Schutte, Budapest, Hungary; Bourla Freres, Istanbul, Turkey.

POTTER & JOHNSTON MACHINE CO.
Pawtucket, R. I.

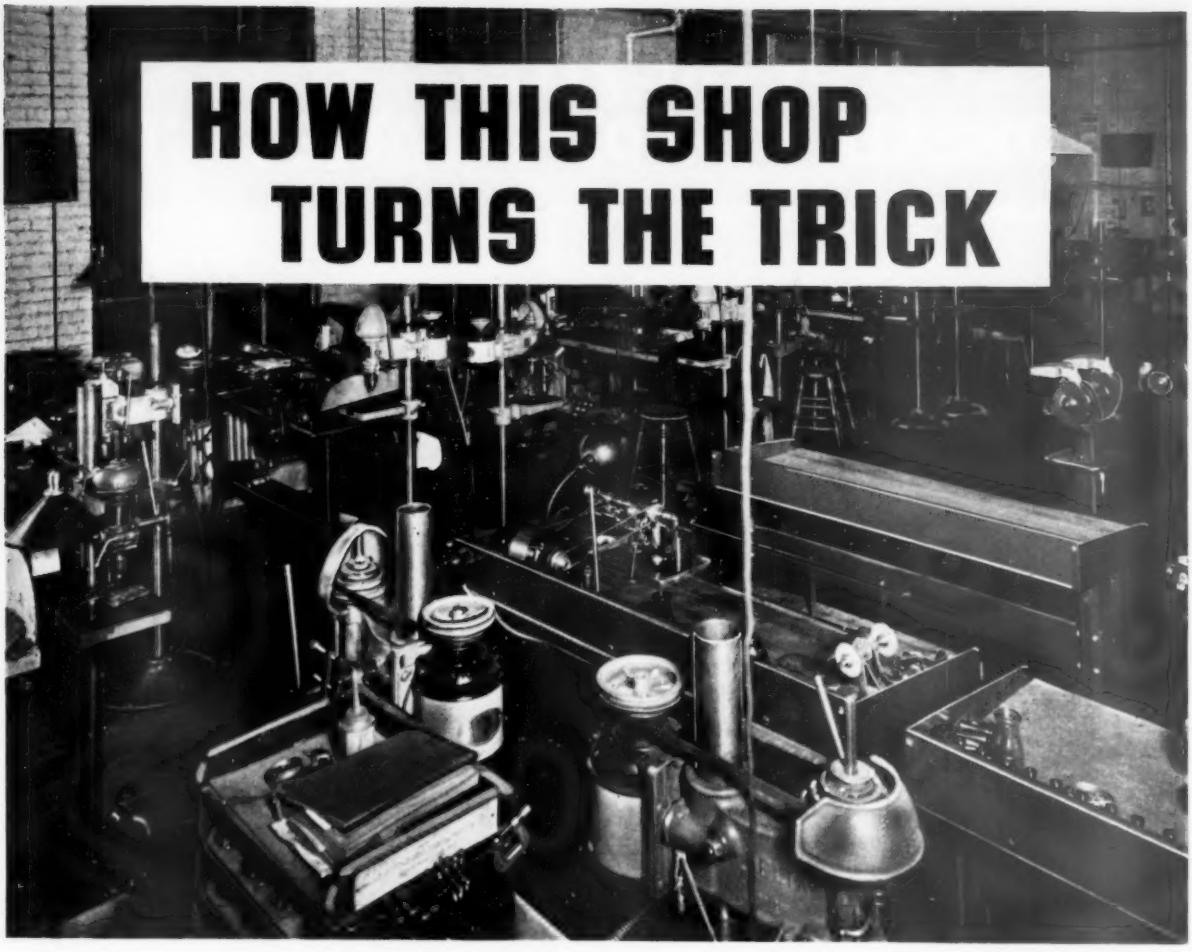
Please send us your new catalog giving full specifications of your 5-D Power-Flex model Automatic Chucking and Turning Machine.

Company .....

Address .....

Individual .....

HOW THIS SHOP TURNS THE TRICK



Saves Toolmaker's Time - - Cuts Tool Costs

Here's a tool room scene that tells volumes! It is the plant of a large Eastern Tool and Die Works where they really have learned how to cut tool-making costs! You will note that every tool maker has a low-cost Delta Drill Press at his bench. With a small investment all "waiting for the machine time" has been eliminated and the cost of the drill presses has been quickly made up--and tool making has been speeded up--which means more money saved. In this same shop Delta Super-Safety Grinders and metal cutting Band Saws also help increase profits. If you are interested in reducing toolroom costs, find out what Delta Tools can do for you.

Send For Drill Press Bulletin

giving complete specifications, prices and technical data on the entire line of Delta 11", 14" and 17" drill presses. Mail the coupon.

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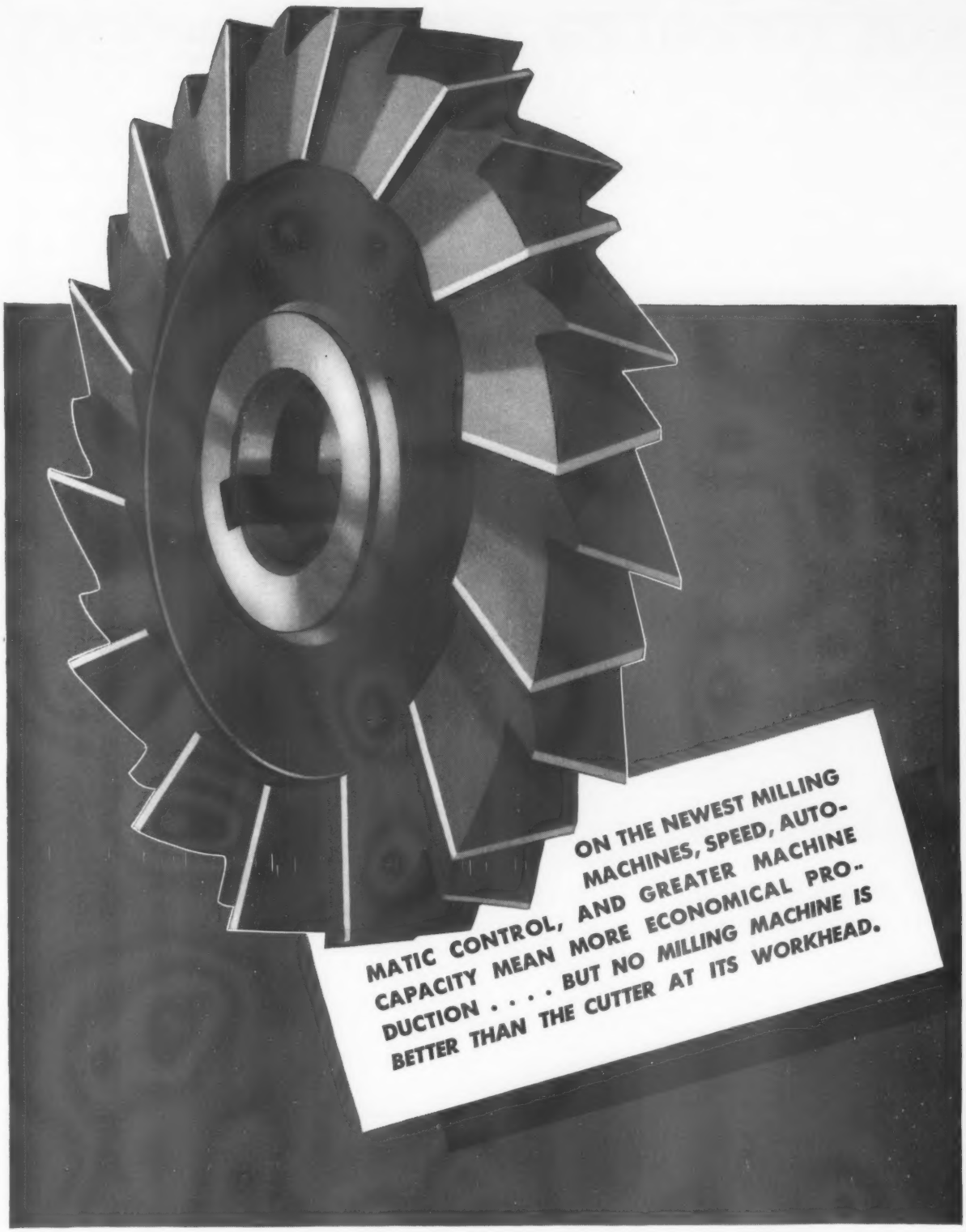
MILWAUKEE, WISCONSIN

Delta Mfg. Co. (Industrial Division)
518 E. Vienna Ave., Milwaukee, Wis.
[ ] Please send me Special Delta Drill Press Bulletin.
[ ] Please send me complete Catalog of Delta low-cost tools.
Name .....
Address .....
City ..... State .....


ON THE NEWEST MILLING MACHINES, SPEED, AUTOMATIC CONTROL, AND GREATER MACHINE CAPACITY MEAN MORE ECONOMICAL PRODUCTION . . . . BUT NO MILLING MACHINE IS BETTER THAN THE CUTTER AT ITS WORKHEAD.

MORSE

THERE *IS* A DIFFERENCE

TWIST DRILL AND MACHINE COMPANY

NEW BEDFORD, MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE ST. - - - - CHICAGO STORE: 570 WEST RANDOLPH ST.

THE TOOL ENGINEER

(Continued from Page 11)

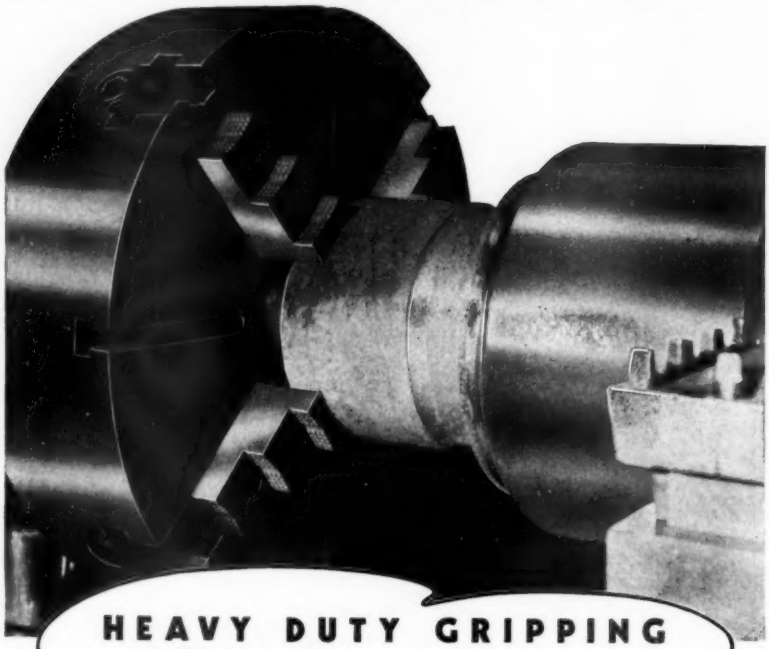
fatigue, increase safety, improve the surroundings in which he spends his working day, make possible higher wages and shorter hours, and still make possible products of lower price and better quality to the consumer. The result of all these things is wider markets, more employment, and we secure these objectives on a substantial foundation.

The Last Forty Years

That this is not all theory is amply demonstrated by the actual experience of this country in the past forty years. During the period of greatly increased mechanization of our industry, the weekly hours of labor in this country have gone steadily down. In 1899 they were 57 hours per week; in 1909, 55; in 1919, 50; in 1929, 48; in 1937 the average was about 40 hours per week. Note that the most substantial reduction in the weekly hours of labor came long before "Wage and Hour" and "Fair Labor Standards" legislation. They were the natural result of the increased efficiency of the American workman due to increased mechanization.

In the same period of time, the number of people employed in the manufacturing industries have increased faster than our population as a whole, and the average wage has increased in buying power from $1.00 in 1899 to $1.50 in 1937. Furthermore, as you would naturally expect, those industries which have most greatly increased the use of power, which is after all a reflection of increased mechanization, are those that have increased employment. It is in these industries that you will find the best working conditions and the best wage rates.

This, then, is the fundamental importance of the work that the Tool Engineer is doing, and the reason why I believe that there is going to be a continuing and a growing demand for the skill that you offer to the American manufacturing industry. Let's go a step further. It is not enough to render this service, but those of us who understand these things and who are familiar with the facts that I have just repeated to you, should do everything they possibly can to have them more widely understood by the citizens upon whose decisions rests, in the last resolution, the welfare of the nation. We are glad to see the work that your splendid Fact Finding Committee under Professor Younger has done and we hope that your Association will continue to use its great influence to widen the popular understanding of the great value of the machine to all of our people.



HEAVY DUTY GRIPPING
with hair line accuracy . . .

These heavy chilled iron rolls come from the foundry practically "file hard." Furthermore, the heavy duty turret lathe on which the finishing operations are handled must be equipped to take work of varying diameters and forms, necessitating a 24" Cushman 4-Jaw Independent Chuck with a wide range of adjustment, and with parts of sufficiently ample cross-section bearing surfaces to withstand the application of long handled wrenches for maximum grip on large work pieces. Operating screws and Thrust bearings are proportioned to withstand heavy mill shop service.

Here is the kind of a job that will quickly show up the slightest structural weakness in a chuck . . . or the least deviation from precision alignment of jaws or body. The massive combination of this type of chuck reduces chatter to a minimum and makes possible the superior finish now being demanded on turned or bored surfaces. This extra heavy Cushman Steel Body Chuck is as accurate and smooth in operation as the Cushman Chuck on your tool maker's lathe or high speed automatic. It was designed and built by Cushman Engineers who have, we believe, the broadest precision chucking experience available to industry today. Write us regarding your own chucking problems, large or small.

FOR PROFITS MACHINE TOOL SHOW
CLEVELAND
OCT. 4 to 13, 1939

A world standard for **PRECISION**

THE CUSHMAN CHUCK COMPANY, HARTFORD, CONNECTICUT

CHUCKING ENGINEERS *Since 1862*

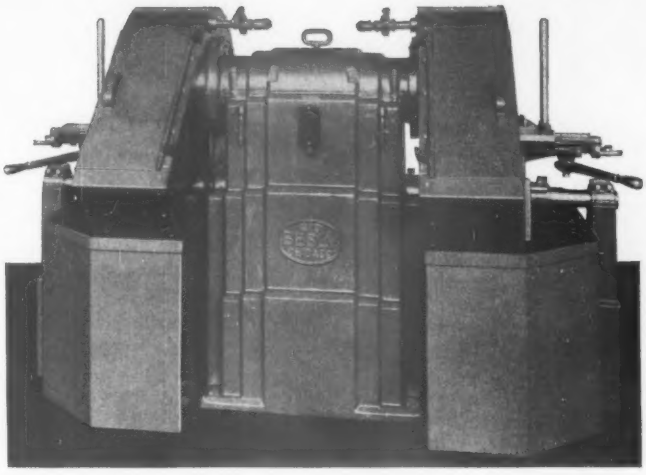
CHAPTER DOINGS

(Continued from Page 20)

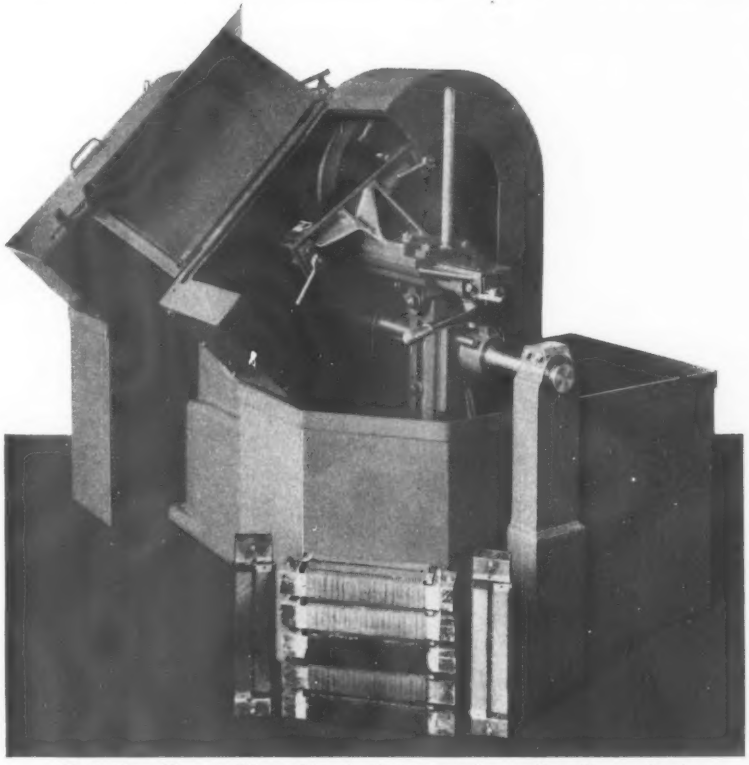
Chapter. Berna & Brandt spoke at **Rochester** on Tuesday night before a good crowd and at **Syracuse** on Wednesday night. Eighty-one attended this lecture. **Syracuse** is having their second annual Clambake on September 9th at Hinerwadel's Grove and are making plans for a bigger and better bake than last year. Any ASTEer in the vicinity on that date is welcome to attend. They have broken out with their own News Edition in which there is an "Obituary" notice stating that ASTEer Ted Corbett had ceased to be a bachelor on May 27th. All the boys hope that Ted's troubles will all be "little ones." The team of Berna and Brandt spoke at **Schenectady** to an audience of about sixty on Thursday night. This winds up their technical sessions until fall. Eddie Girardot is making plans for four Public Speaking classes to start this Fall. Harry Crump promises a bang up time at their Outing on August 26th. **Elmira** wound up their season on June 16th and had as their guests the Industrial Management Association of Elmira. Eighty-five members and guests representing thirty industrial plants in the district heard the team of Berna and Brandt. Eight applications for membership were received at this meeting. Their next meeting will be in September.

Plan now to attend the A.S.T.E. sessions of the Machine Tool Builders Show, Cleveland October 4th-13th. A.S.T.Eers from coast to coast and from Canada to the gulf will attend, at the same time, the A.S.T.E. Semi-Annual Meeting.

The Unusual BESLY GRINDER JOB



Illustrations show #210-18"-L Besly Wet Grinder especially equipped for grinding coils for electrical control. Operation consists of grinding enough Bakelite, cotton covering, insulating varnish and copper wire so as to properly expose the contact surface. • Not so unusual for Besly who in the last fifty years have furnished machines for grinding (in addition to most known metals) such materials as cork, rubber, terra cotta, fibre, catalin, Bakelite, refractories, glass, pottery, porcelain, building brick, ivory, paper, quarry and floor tile, etc. • Take advantage of this well rounded experience and put your flat surfacing-problems up to us. • Our knowledge gained through almost fifty years of Besly grinding is yours for the asking.



Note the efficient Water Hoods that properly confine the coolant.

Write for your copy of Booklet on Besly Titan Steelbacs.

CHARLES H. BESLY AND COMPANY

118-124 NORTH CLINTON STREET ★ CHICAGO, ILLINOIS

WHAT OTHER REAMER GIVES YOU ALL THREE FEATURES—?

" — adjusts like a micrometer" over wide diameter range in steps of .0005".

Diameters easily increased or decreased while bar remains in machine.

Blades float in bar —yet retain any selected diameter.

★ Write for Catalog No. 40—Get the complete MIKRO-LOK story.

Eclipse 1914 25 YEARS 1939

ECLIPSE COUNTERBORE CO.
DETROIT, MICHIGAN.

REHABILITATION

(Continued from Page 30)

upon the method of budgetary control used.

Summary—Planned Maintenance and the Maintenance Budget

Maintenance and Rehabilitation is a national responsibility.

The executive should know these maintenance problems and should provide methods of accounting for their financing.

Definite methods of establishing Maintenance Budgets and Appropriations must be provided—in addition to Standard Depreciation Accounts.

Maintenance Divisions with proper personnel must be provided.

Rehabilitating and Maintaining America in Times of Depressions

Stabilization and control of finance by management through maintenance equalization budgets or equalization reserve accounts can provide for rehabilitation and maintenance during slack periods.

Equalization budgets and reserve accounts for this purpose can be established as follows:

An accrual rate shall be determined by listing specific items of expense that are to be included in the maintenance program. A period of accrual of recurrence for each individual item shall be estimated. The normal monthly accrual for each item shall be obtained by dividing the amount of expense estimated for that item by the accrual period in months. The total normal monthly accrual shall be computed by summarizing the accruals for the individual items. As an example:

Overhead Crane—original cost	$35,000
Accrual period	15 years
Estimated expense for maintenance during accrual period	$5,800
Annual accrual	$387
Buildings—original cost.....	$500,000
Accrual period	5 to 10 years
Estimated maintenance expense	$76,950
Annual accrual	$9,270
Monthly accrual	$773

This accrual amount may or may not be spent monthly, but is provided during periods of maximum production and is available during shut down and slack periods for maintenance work and promoting steadier employment.

Annual maintenance appropriations are just as necessary and should be provided the same as capital goods expenditures.

If nationally adopted this maintenance and rehabilitation method will go far toward leveling out depression periods.

First International Chapter of A.S.T.E. Chartered in Toronto

First chapter outside of the United States to be chartered is Toronto, Canada. On June 28th more than fifty Tool Engineers of the Toronto, Hamilton, St. Catherines industrial area established their chapter and became affiliated with the National A.S.T.E. body.

At Last!

A POSITIVE ROLL GRIP KEYLESS

DRILL CHUCK

that fills a long-felt need

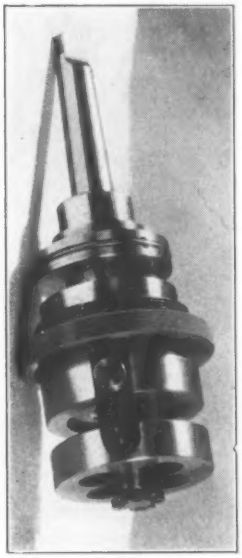
Check these advantages:

1.—A chuck that will not let your drills slip.
2—100% keyless.
3—The heavier the load, the tighter it grips.
4—No more drill shanks damaged by chucks.
5—Yes! The tapered shanks are tempered.
6—A slight twist of the wrist releases drill.
7—Scientifically designed — ruggedly constructed.
8—Will run true and remain so during its life.
9—Unconditional one-year guarantee (barring abuse).

A folder giving prices and complete details will be mailed to you just for the asking.

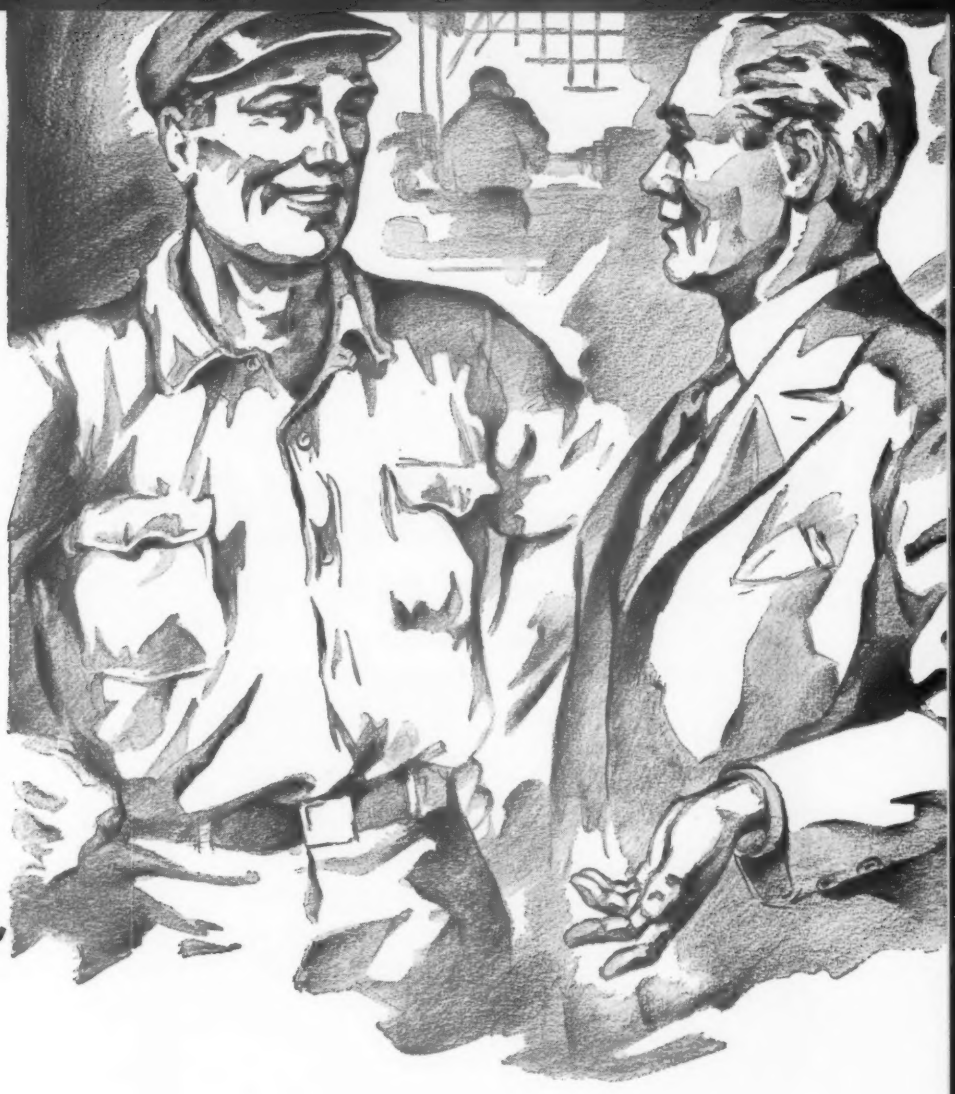
MOTOR TOOL MFG. CO.
12281 Turner Avenue Detroit, Michigan

Rickert-Shafer "BR" Collapsible Tap



Live Spindle Type
Accurate, Simple, Ruggedly Built
Guaranteed for the most exacting requirements

RICKERT-SHAFER COMPANY
Erie, Pa.



"NOW YOU'RE *Talking* MY LANGUAGE!"

THE smart lathe operator knows that he has a partner on a job—that he and his machine produce together as a unit. He knows that he's on a spot if his lathe cannot produce the quality and volume of work that he could turn out on a better machine.

But give him a new Monarch—and you'll see *team work* of the highest caliber—you'll agree that a good man and a good machine make an unbeatable combination.

Make this test today. Tell the man who is trying hard but falling down on the job that he will work on a Monarch lathe from now on. Watch his face light up in a smile of appreciation. Hear him say: "Boss, you're talking my language."

MONARCH COVERS THE TURNING FIELD
and includes:
AUTOMATIC SIZING
Magna-Matic LATHES
5-T MANUFACTURING LATHES
MODEL "C" TOOL ROOM LATHES
10" SENSITIVE PRECISION LATHES
MONARCH KELLER LATHES
ENGINE LATHES
Write for Catalogs.

Modernize With Monarch!

THE MONARCH MACHINE TOOL CO., Sidney, Ohio, U.S.A.

MONARCH LATHES
COVER THE TURNING FIELD

Chicago Sales Office: 622 West Washington Boulevard. • Indianapolis Sales Office: 3115 North Meridian Street. • Newark Sales Office: 1060 Broad Street. • Pittsburgh Sales Office: 604 Chamber of Commerce Bldg. • *Agencies in principal industrial centers of this and foreign countries.*

NEW *Equipment*

Mention of the Tool Engineer in your correspondence with manufacturers lends prestige to your request.

National Spline Taper Drive Counterbores in Sets

To their recently developed line of Spline Taper Drive Counterbores, the National Twist Drill & Tool Company, Detroit, has added sets of Counterbores designed to meet the needs of the average Tool Room and smaller shop.

The No. 2 Tool Room Set, illustrated here, has two Holders and Interchangeable Cutters from ½" to 1¼" diameter inclusive. Pilots from 9/32" to ⅞" diameters are interchangeable within the respective ranges of Cutters and Holders. In addition, there are Countersinks for 60°, 82° and 90° included angles. The 60° Cutter is for centering work, while the 82° and 90° Cutters are suitable for countersunk head screws. A No. 1 Set, ranging from ¼" to 7/16" diameter, and a No. 3 Set having a range up to 3" diameter, are also available. These sets come in strong wood boxes, recessed to suit the individual tools.

New! the "JUNIOR"

A Colonial Press for less than . . . $500

Above: Size Comparison with Colonial Open Side Utility Broaching Press

"JUNIOR" DATA

Capacity	½ ton
Stroke	10 in.
Height	31 in.
'Floor' Space	12 x 22 in.
Platen	8 x 12 in.
Clearance	5 in.
Weight	750 lbs.

Complete in every detail . . . Streamlined design with built-in 1 h. p. motor . . . 1000 lb. hydraulic pressure system and controls . . . Adjustable stroke.

Mount it on a bench for miscellaneous assembly work . . . for all kinds of light broaching jobs . . . Mount it anywhere for pressing parts on arbors . . . Quick delivery.

COLONIAL BROACH COMPANY 147 JOS. CAMPAU DETROIT, MICHIGAN

Please send me descriptive Bulletin of your new 'Junior' low cost Presses.

Name ..... Title .....

Company ..... Address .....

Quality Hardware and Machine Company Takes Over "Modern" Motor Drive

The Quality Hardware and Machine Corporation of Chicago has taken over the Modern Motor Drive and will manufacture this conversion drive unit in their plant at 5845 North Ravenswood Avenue, Chicago.

The Modern Motor Drive is applicable to any belt driven machine, and is especially suited for converting line shaft drives on cone pulley machines to individual motor drives. The drive is a complete self-contained unit, including motor mounting, that is easily applied by means of four bolts. "V" belts are used for the motor drive to the countershaft, the final drive being by standard flat belt. A crank and screw control that actuates a cam working directly against the base of the motor and drive shaft mounting, provides a wider range of adjustment. The fast and positive action of this control, it is said, makes it simple to keep belts always in proper tension, or to loosen them as needed for easy shifting of cone pulley drives. The control is hand operated, though the units can be equipped for electrical controllers.

In addition to the column mounting illustrated for use on lathes, shapers, and similar machine tools, the company has also perfected a new series of mountings for power saws and similar types of equipment.

Hydraulic Press Finger-Tip Pressure Control

Hannifin Manufacturing Company, 621-631 South Kolmar Avenue, Chicago, has developed a new type of sensitive pressure control for use on Hannifin Hydraulic Presses for straightening, forcing, press assembly and similar work. The press illustrated is a 20-ton high speed straightening press equipped with both hand and foot lever control.

The operation of the new pressure control allows an unusually rapid operating cycle, with finger-tip or light foot control of the ram movement on the advance stroke, and of ram pres-

(Continued on Page 48)

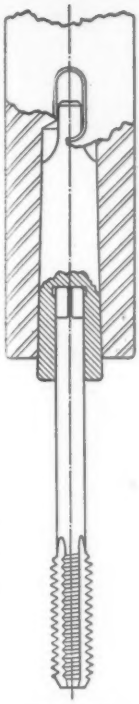
Mention "The Tool Engineer" to advertisers

Standardize . . .

WITH SCULLY • JONES METHODS OF DRIVING TAPS

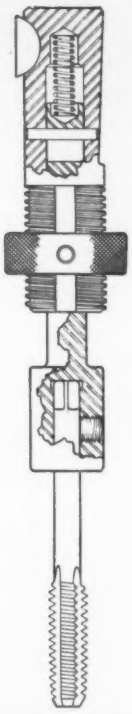
Universally used for Individual or Mass Production

See our Standard Tool Catalog Number 400



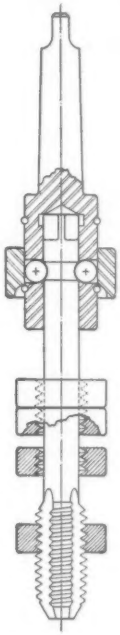
SOLID TYPE TAP CHUCK DRIVER

FLOATING HOLDER TAP DRIVER



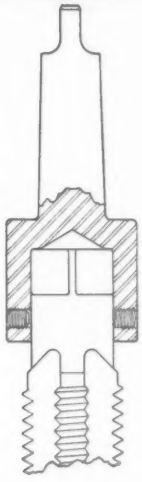
ADJUSTABLE ADAPTER, COMPRESSION TYPE, TAP DRIVER

MAGIC TYPE QUICK CHANGE TAP DRIVER



QUICK CHANGE TAP DRIVER

FLOATING, TENSION TYPE, TAP DRIVER



HEAVY DUTY DRIVER FOR LARGE SIZE TAPS

CLOSE CENTER TAP DRIVER

STYLE "A" SPRING COMPRESSION TAP DRIVER

SCULLY • JONES & CO.

1905 SOUTH ROCKWELL ST., CHICAGO, ILLINOIS

METAL CUTTING PRACTICE HAS MOVED UP

HAS YOUR SHOP MOVED WITH IT?

MANY SHOPS still have too much of the metal cutting equipment of a generation ago, when economy meant skimping and speed was measured in days instead of minutes! Fighting competition with such obsolete tools is like stalking lions with bow and arrow—picturesque, maybe, but not very effective.

If a check-up of your metal cutting tools reveals nothing but the solid type, why not start modernizing by installing tools such as are pictured here? In these, the bits only are made of cutting steel, for economy and to facilitate flexibility of use. The holders are of chrome nickel steel for strength. A wide variety of styles and sizes are available, with bits for every job. Find out how the OK System can save you money. Our representative will gladly explain it without obligation.

PRODUCTS OF THE OK TOOL COMPANY, SHELTON, CONN., U.S.A.

TRADE OK MARK

INSERTED-BLADE METAL CUTTING

TOOL SYSTEM

FOR CLAMPING WORK UP, DOWN, HORIZONTALLY, OR AT AN ANGLE

Q-C JACKS ARE THE FASTEST AND MOST POSITIVE METHOD AVAILABLE

Furnished with hand knob, straight or crank handle, unlimited range of sizes. $1\frac{9}{16}$" travel in 180° movement of handle. Vibration or tool pressure will not open.

Try these jacks on your milling, drilling and other fixtures.

Send for complete engineering data on full line of Q-C standardized tooling units.

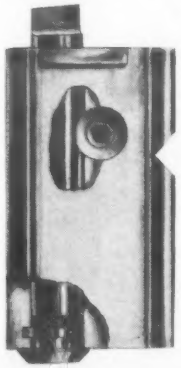
Q-C ENGINEERING PRODUCTS

6666 TIREMAN AVE. **DETROIT, MICH.**

DESIGNERS — BUILDERS

DIES—JIGS—FIXTURES AND SPECIAL MACHINERY

CUT MACHINING TIME AND COSTS WITH WETMORE TIME-SAVER UNITS



Machining time and costs are reduced by WETMORE Time-Saver Units because they provide these positive advantages:

— eliminate present slow, costly, unreliable methods of adjustment.

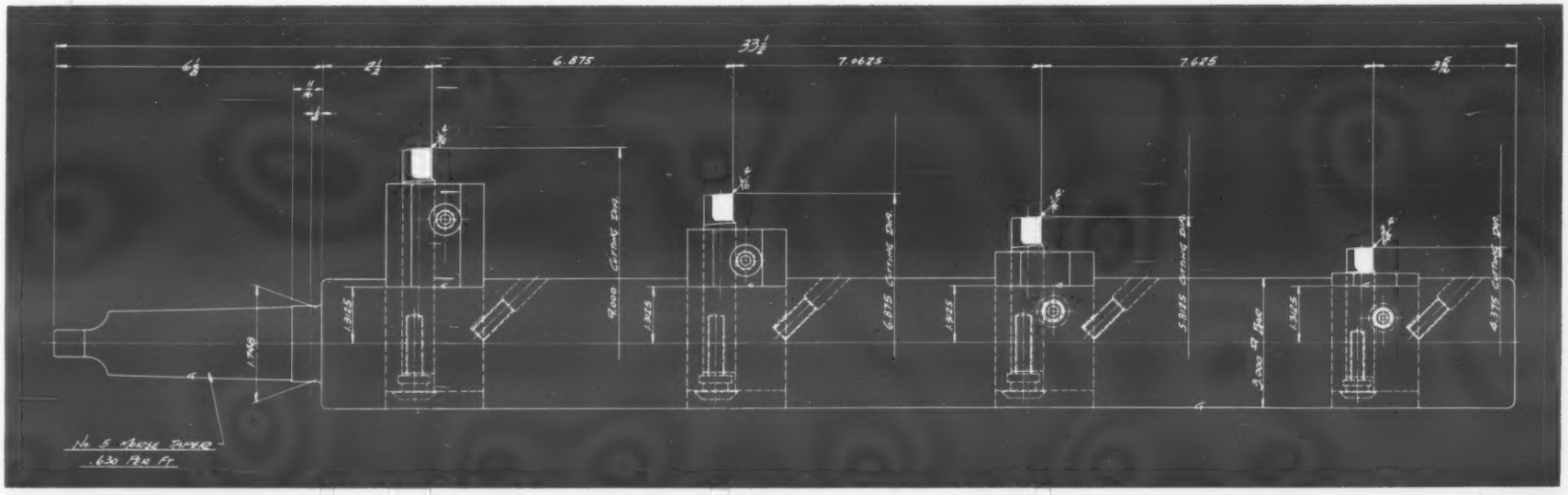
— provide rapid, accurate adjustments in either direction with graduated screw.

— wedge lock positively and solidly locks tool without changing setting.

— rugged construction of unit and firm grip of cutting tools by wedge lock adds to cutting life by elimination of vibration.

Send in your drawings—WETMORE engineers will design tools to reduce tool-setting time and cost per piece machined. See your WETMORE representative for many surprising possibilities and applications.

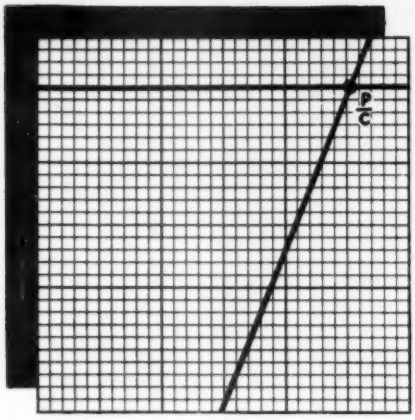
WETMORE Time-Saver Units Are Adaptable to Bars, Boring and Turning Heads.



Showing How One Bar Is Used for Four Different Diameters: The diagram shows a bar equipped with four interchangeable WETMORE Time-Saver Units—doing fast, accurate boring of four different diameters of holes. This bar can be equipped with other interchangeable WETMORE Time-Saver Units for boring different diameters of holes.

WETMORE

WETMORE REAMER COMPANY, Dept. TL **420 N. 27th St., Milwaukee, Wis.**



The P/C Point

"PERFORMANCE DIVIDED BY COST"

Performance and cost are of utmost significance today in the tool room and in die and mold shops. This is why hundreds of Gorton Super-Speed Milling Machines are now in use in the Plastics, Rubber, Glass, and Forging industries.

Savings of as much as 75% can be effected with Gorton machines and in most cases they pay for themselves during the first year of operation. Forty-five years of experience in building fine machine tools are back of every Gorton machine.

Also makers of Gorton Duplicators and Pantographs.

What is Your Problem?

Let us know what your problem is, perhaps we can help you effect substantial savings. Send us a description of the work you are doing, and we will return cost and time data promptly.

GEORGE GORTON MACHINE CO.

1111 13th St., RACINE, WISCONSIN

MAC-ITS Save on Production, Maintenance and Design!

Stronger, more accurate screws can end many tie-ups—save labor and replacements—and cut costs all along the line when your designs take advantage of their greater strength.

Mac-its give you all these savings in 16 standard items. For complete details, call your Mac-it distributor or write today for your copy of Catalog 38, listing the only complete line of heat-treated, alloy steel screws!

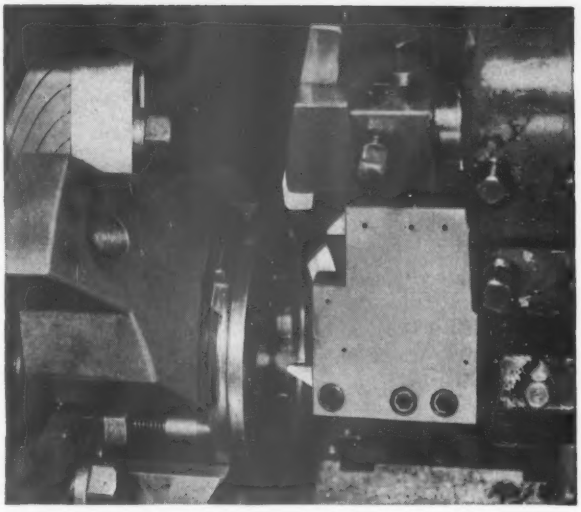
THE STRONG, CARLISLE & HAMMOND COMPANY
1392 West Third St., Cleveland · Ohio

Haynes Stellite "2400" tools are standard on these turning jobs *because* they reduce the cost per piece machined

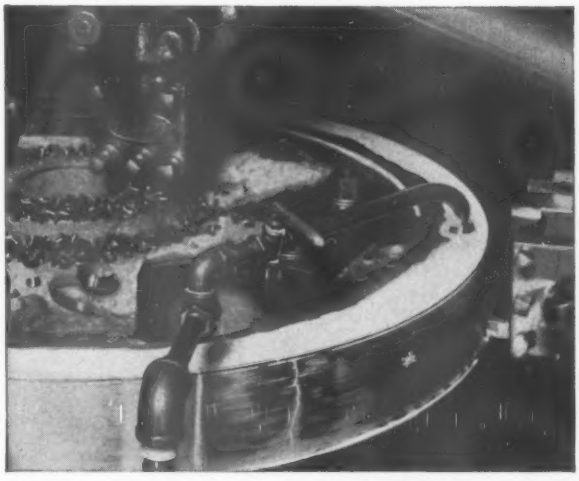
•

Our engineers, widely experienced in production work, are ready to help you select the most economical cutting tool for each operation. Ask for this service today.

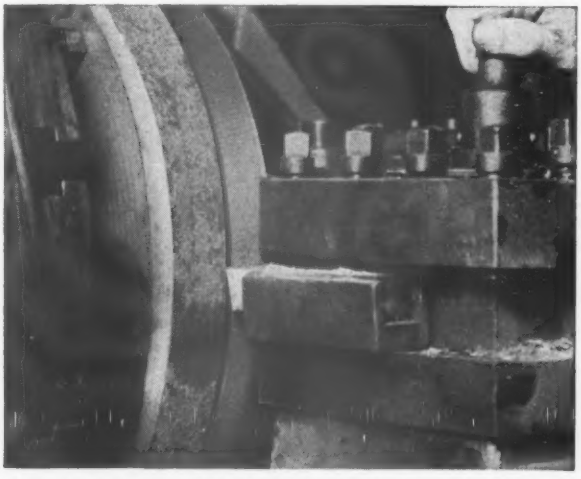
PRODUCTS OF A UNIT OF UCC UNION CARBIDE AND CARBON CORPORATION



Turning the O.D. and chamfering a 5½-in. chromium-nickel steel gear blank of 300 Brinell hardness with Haynes Stellite "2400" tool bits.



Turning a 47-in. O.D. gear blank of SAE 1035 steel with a Haynes Stellite "2400" welded-tip tool.



Rough-turning an 18⅜-in. O.D. cast iron brake flywheel with a Haynes Stellite "2400" tool bit.

2400 HAYNES STELLITE TRADE MARK

Red-hard, wear-resisting alloy of cobalt, chromium and tungsten

HAYNES STELLITE COMPANY

Unit of Union Carbide and Carbon Corporation

UCC

Chicago • Cleveland • Detroit • Houston • Los Angeles • New York • San Francisco • Tulsa

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Haynes Stellite hard-facing rods and information on other Haynes Stellite Company products also are available through all apparatus shipping points of The Linde Air Products Company

"Haynes Stellite" and "2400" are trade-marks of Haynes Stellite Company.

Fixture to drill holes in manifold. All points of drill thrust are automatically compensated.

CALL ON OUR ENGINEERING DEPARTMENT FOR SUGGESTIONS

ECONOMIZE IN TOOLING COSTS BY USING SWARTZ FIXTURES

All Fixtures Have Hardened and Ground Working Parts . . . Built To Outlast Many Toolings

SWARTZ TOOL PRODUCTS CO., INC.

5259 Western Avenue — **ASK FOR CATALOG 238** — **Detroit, Michigan**

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Indianapolis—J. W. Mull, Jr.
Milwaukee—Geo. M. Wolff, Inc.
Tulsa, Okla.—Brammer Machine & Tool Service Co., Inc.

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ARBOR PRESSES

In 12 Sizes, from ¾ to 12 ton Pressure Capacities

Catalog FREE

A complete line of bench and floor presses with improved designs, handier, more versatile and stronger size for size. Frames are semi-steel, Rams and Gears, alloy steel, heat treated and ground.

Machinery Dealers

Some territories Still open

Sheldon Machine Co. Inc.
1619 N. Kilbourne Ave.
Chicago, U.S.A.

You buy the best tools you can get.

Match this with the best recutting you can get.

REMEMBER THE NAME

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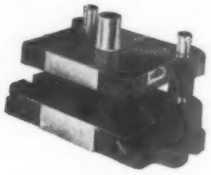
DETROIT, MICH.

DANLY

PRECISION DIE SETS



Danly All-Steel Sets
Danly Commercial Sets
Danly Die Makers' Supplies

DANLY SERVICE

8 Danly Warehouses Provide 24-Hour Service for 85% of All Metal Fabricating Plants

Danly Machine Specialties, Inc.

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DANLY DIE MAKERS' SUPPLIES

Longer Periods of Uniform Accuracy

★ Up to 50 Times Greater Life ★

Carboloy cemented carbide is particularly well suited to use on most types of master and production gages. Its extreme hardness and high resistance to abrasive wear assure long periods of uniform accuracy with total gage life up to 50 times longer than ordinary steel gages.

Many leading gage manufacturers—as well as Carboloy Company—are prepared to supply their gages equipped with Carboloy cemented carbide. In many cases, Carboloy can also be applied to your present gages. Application is simple and economical. Usually a small insert of Carboloy—replacing the steel at the actual point of wear—is sufficient. Send sketches, blueprints or sample gages for specific information.

CARBOLOY COMPANY, INC.

11145 EAST 8-MILE STREET, DETROIT, MICHIGAN

CHICAGO • CLEVELAND • NEWARK • PITTSBURGH • PHILADELPHIA • WORCESTER, MASS. *Canadian Distributor:* Canadian General Electric Co., Ltd., Toronto

Can the Repeat Customer Be Wrong?

One User Installed in a Short Time

THREE

DETROIT UNIVERSAL DUPLICATOR

It Does

Automatic Die Sinking
Die Making
Turning
Shaping
Planing

With close limits and at reasonable cost.

Rotary Pilot Bushing

Manufactured by

GIERN & ANHOLTT TOOL CO.
1312 MT. ELLIOTT AVE.
DETROIT, U. S. A.

ZIEGLER

ROLLER DRIVE

Floating Holder

FOR

TAPS — REAMERS
COUNTERBORES
DIE-HEADS

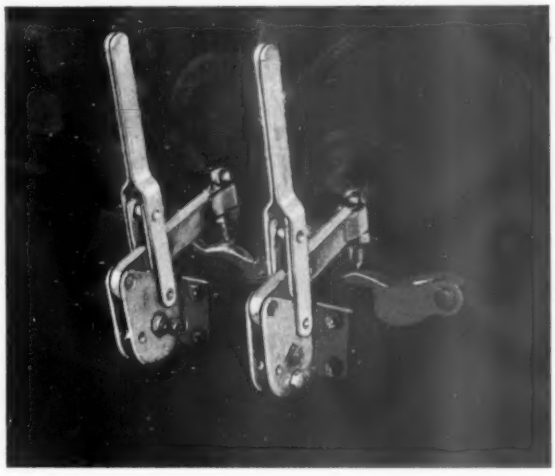
Compensates for spindle misalignment, eliminating oversized or bell-mouthed holes.

It is adaptable to all single and multiple spindle machines used for tapping and reaming. Shanks are furnished to fit all makes of machines and multiple spindle heads.

Much set-up time is wasted, many parts are scrapped, trying to produce uniform and accurately tapped and reamed holes on machines with spindles out of alignment with the work. Many taps are condemned for this reason and many holes are reamed bell-mouthed or oversize. A Ziegler Floating Tool Holder will eliminate these difficulties. A trial on your most difficult job will convince you.

WRITE FOR FULL INFORMATION

W. M. ZIEGLER TOOL COMPANY
1920 Twelfth Street **Detroit, Michigan**



Knu Ways Replace the Old!

Why not incorporate Knu-Sine Toggle Clamps into those new jigs and fixtures you are about to build? Fast, positive clamping, hinged base allows of flexibility in installation.

15-Page Catalog Free on Request

KNU-VISE INCORPORATED
6430 Cass Ave., Detroit, Mich.
CANADIAN OFFICE
52 Chatham St. West, Windsor, Ont.

BRADFORD

4-STATION AUTOMATIC DRILLING MACHINE

for performing several operations on an oil distributor for auto engine

OPERATIONS

Station No. 1—Load and unload one piece.
Station No. 2—Drill 1—½" hole ½" deep. Drill 1—⅜" hole ⅜" deep. Drill 2—$\frac{21}{64}$" holes ½ way (½" deep).
Station No. 3—Finish drill 2—$\frac{21}{64}$" holes. Drill 1—$\frac{11}{32}$" hole ¾" deep.
Station No. 4—Spotface two—$\frac{21}{64}$" holes, $\frac{11}{16}$" diameter. Tap 1—⅛x27 straight pipe thread—415 R.P.M.

Net Production, 85% Efficiency—350 per hour

A 4-station automatic BRADFORD machine for performing several operations on an oil distributor body for an automobile engine. The machine is entirely automatic, the operator's duties consisting only of loading and unloading. Control and timing of the mechanism is entirely electric, being accomplished by limit switches and relays with an electric safety device to prevent indexing if the fixtures are not clear of interference.

Write for descriptive literature on this and other BRADFORD cost-saving equipment.

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Cincinnati (Established 1840) Ohio

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The Vinco

Angle Tangent To Radius Dresser for Internal, External and Surface Grinding Machines

Patented June 5, 1934. Other patents pending.

Thousands of dollars are lost annually in tool, gage and grinding departments by using obsolete methods in dressing angles and radii on abrasive wheels. The Vinco Angle Tangent to Radius Dresser has the basic patented feature of dressing angles and radii from the same axis without moving the diamond. Angles and radii are always accurate and tangent. It is acknowledged by hundreds of users to be the only accurate, economical and efficient dresser on market. It is a permanent, precision-made tool and will last a life-time. It eliminates all worry and uncertainty, and saves 75% in dressing costs. It is fully guaranteed to be satisfactory. *Send for Descriptive Circular.*

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7350 Central Ave. Detroit, Mich.

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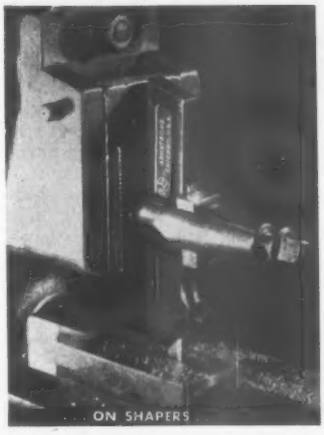

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Narrowing profits and limited volume are teaching us to do unprofitable work profitably, to cut costs by producing more per hour and by eliminating unnecessary risks and errors. These "brass tack" times have been marked by the passing of haphazard tooling and tools. Close figuring leads to fact finding and more universal knowledge of costs is ending the use of single purpose forged tools for standard operations on lathes, planers, slotters and shapers. To be in line today, such work must be done with ARMSTRONG TOOL HOLDERS that: "Save All Forging, 70% Grinding and 90% High Speed Steel."

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NEW EQUIPMENT

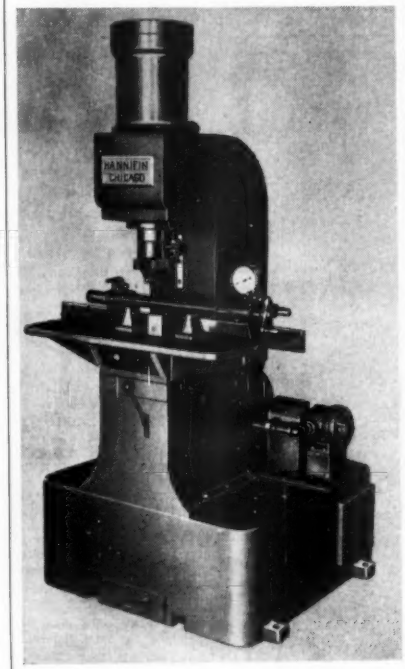
(Continued from Page 38)

sure during the working stroke. Ram movement both up and down, and pressure control is accomplished by means of a single hand lever or foot pedal.

The operation of this new control is as follows: Initial movement of the control lever (within the first inch of lever travel) moves the ram down rapidly, at nominal pressure. The ram will move down until it touches the work, and then stop. Movement of the control lever beyond the approach position causes pressure to be exerted by the ram, the working pressure being proportional to the distance the control lever is moved. Thus any required working pressure at the ram, up to the capacity of the press, can be obtained merely by moving the control lever down. Releasing the control lever at any point automatically returns the ram to top position with a high speed return stroke.

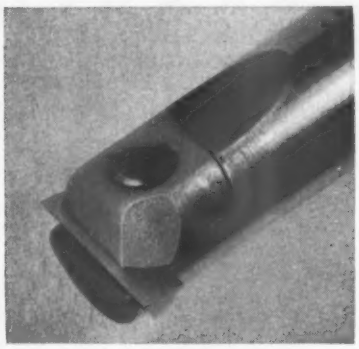
Production straightening operations can be carried on faster, and with greater accuracy it is said due to the simplicity and ease of handling of this new control.

Working pressures produced at the ram are not only under sensitive and accurate control, but are plainly indicated on a dial gauge reading in tons. The straightening press illustrated here is provided with an adjustable ram



stroke, reducing the length of return stroke where the maximum gap is not required to accommodate the work. Unnecessary ram travel is eliminated.

The new Hannifin finger-tip or foot pedal pressure control is adaptable to many different types of hydraulic presses, and is of special value in press-assembly operations. With the



The new Everede Boring Bar is the only bar on the market having the economical triangular bit. The design of this boring bar permits the use of a larger diameter than formerly used, due to having the bit cut in front, making room for the bar. This design spells rigidity, making higher boring speeds and heavier cuts possible.

The Everede Boring bars are made of the finest heat treated nickel steel; and each bar comes equipped with six high speed steel triangular bits. In addition, this is the only boring bar that allows the use of a solid Stellite or carbide tool bit. This is accomplished by clamping the bit on the "V" type grip, which holds it firmly without danger of breakage.

Send for descriptive folder.

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Capacity—½" holes through $\frac{3}{16}$" steel; $\frac{13}{32}$" through ¼" steel. Can also be made for holes up to ⅞" in thinner metal. Stock punches and dies available from $\frac{1}{16}$ to ½" by 64ths. Weight, 70 lbs.

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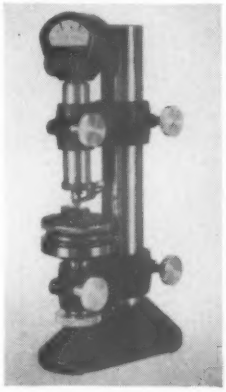
307 E. 47th St. New York

gauge indicating pressure exerted at the ram, an automatic inspection of sufficiently tight fit of parts being pressed into place is obtained. Limits of pressure required for any individual operation are easily determined, and the operator then merely observes the gauge to make certain that the fit is sufficiently tight. Two adjustable hands on the gauge can be set to indicate maximum and minimum pressure limits. Parts too loose or too tight are plainly indicated by the pressures developed in forcing into position. An adjustable stop may also be provided to prevent exceeding the maximum pressure limit. An indicating light fixture may also be furnished. These features are of special value where subsequent operations are performed, as burnishing of bushings, where material will be spoiled if the fit of parts is incorrect.

Swedish Gage Company Mikrokator

This is an instrument designed for "Mikro" (minute) measurements, which employs a frictionless amplification, which assures positive repeat readings of unusual accuracy.



The instrument has unusual "deadbeat" characteristics. Due to light weight of moving parts, pointer responds instantly to slightest movement of measuring tip without swinging past true reading, and effects of vibration are negligible. No lights or electromagnets are used. Heat generated by lights or electrically energized coils is absent; eliminating a warming-up period to stabilize instrument temperature. Having no electrical connections, it can be moved about for use in different locations.

These instruments are furnished with scales graduated to 0".0001, 0".00005, and 0".00002, and scale divisions are of sufficient width to easily read to one-half of a scale division.

The heart of the amplifying mechanism is a metal strip twisted in a helix. The pointer is mounted in the center of this strip, and the strip is twisted left-hand on one side of the pointer and right hand on the other side. One end of strip is anchored to a rigid member. The other end is anchored to a movable member. The spindle carrying the measuring tip transmits its movement to this movable member causing a pull on this twisted strip. A pull on this strip causes the strip to unwind or untwist, this moving the pointer. To completely eliminate all friction bearings, the upper end of spindle is attached directly to this member, and lower end of spindle is supported in a metal diaphragm. The entire mechanism is under tension at all times, so the slightest movement of measuring tip is transmitted to the pointer.

In measuring a flat-piece, or when setting the instrument with gage blocks, you lift the spindle by means of the lifting lever, place the block under the measuring tip, and release the lifting lever to take your reading. In this case, the spindle moves downward to take the reading. The "Mikrokator" gives the same reading in either case.

CALIFORNIA TO HAVE A.S.T.E. CHAPTER

As this issue goes to press news has been received at National Headquarters in Detroit, that Tool Engineers of the Los Angeles, California area are ready to petition for a chapter. The organization meeting will be held in July.

A.S.T.Eer of Chicago Chapter, C. B. Cole, is the author of a new book entitled "Tool Making," published by American Technical Society, Chicago—$3.50. It is written in the "how-to-do-it" style, has many actual working drawings, and is of particular interest to those interested in tool making.

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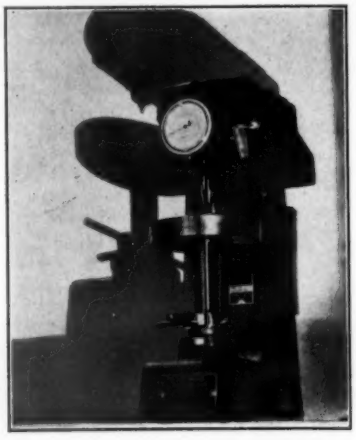

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July Chapter Meetings

Owing to the various summer activities such as annual outings, stag affairs, picnics, clam bakes, etc. etc. most chapters have discontinued technical meetings until September. Chapter "affairs" listed below are those we knew of as this page went to press.—Editor.

DAYTON

July 10, 6:00 P.M., Walter Olt's Farm—Fish Fry, Baseball, True or False Contest between Tool Designers and Sales Engineers.

DETROIT

Detroit Chapter A.S.T.E. Annual Golf Tournament to be held at Gowanie Golf Course, Mt. Clemens, July 15, 1939. A full day's entertainment highlighted by golf, buffet luncheon, and door prizes. $2.00 covers everything.

SYRACUSE

No meetings of the Syracuse Chapter will be held during the summer.

On September 9th the Second Annual Clambake will be held.

ST. LOUIS

July 15th—Stag Annual Outing at Private Club to be announced.

Trap shooting, rifle and pistol shooting, baseball, horse shoes etc. Prizes for all contest winners. All A.S.T.Eers invited.

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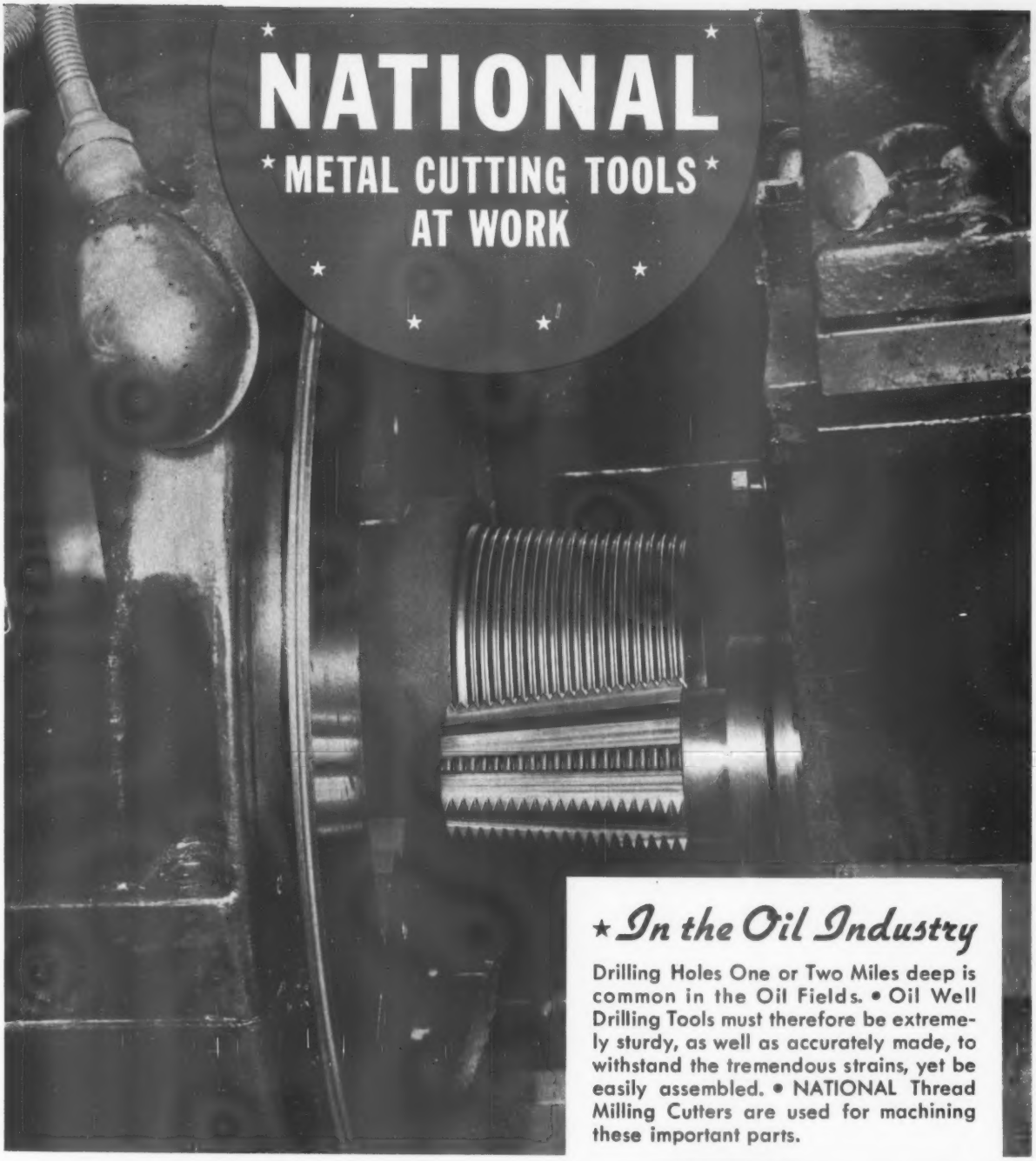

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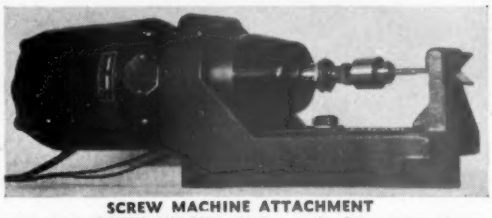

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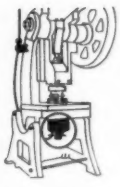

Universal Die Cushions for deep drawing, forming die, pressure pad control, and blanking die stripper actions.

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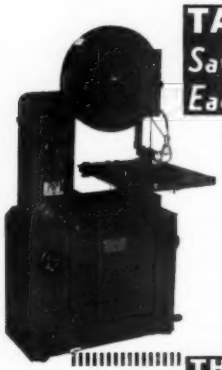

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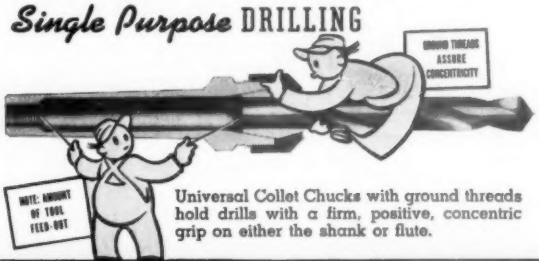

Universal Collet Chucks with ground threads hold drills with a firm, positive, concentric grip on either the shank or flute.

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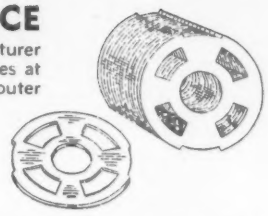

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45	427	62	80 to 100
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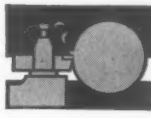

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3	5 1/4	.95	2.25
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Advertisers' Index

Acme Industrial Co. 53
Armstrong Bros. Tool Co. 47
Barber-Colman Co. 26
Besly & Co., Charles H. 35
Bradford Machine Tool Co., The 47
Brown & Sharpe Mfg. Co. 55
Carboloy Co., Inc. 45
Cerro de Pasco Copper Corp. .. 52
Chicago Wheel & Mfg. Co. ... 47
Climax Molybdenum Co. 21
Colonial Broach Co. 38
Columbia Tool Steel Co. 52
Continental Machines, Inc. ... 53
Cushman Chuck Co., The 34
Dairae Tools Co. 56
Danly Machine Specialties, Inc. 44
Davis Boring Tool Division ... 8
Dayton Rogers Mfg. Co. 52
Delta Mfg. Co. 32
Eclipse Counterbore Co. 36
Everede Tool Co. 48
Federal Products Corp. 25
Ford Motor Co., Johansson Gage Division .. 48
Fort Shelby Hotel 54
Gairing Tool Co. 22
Galland-Henning Mfg. Co. 30
Gammons-Holman Co. 54
Giern & Anholtt Tool Co., Inc. 46
Gisholt Machine Co. 27
Glenzer Co., J. C. 53
Gorton Machine Co., George .. 42
Greenfield Tap & Die Corp. ... 10
Hannifin Mfg. Co. 6
Haynes Stellite Co. 43
Hole Engineering Service 52
Holo-Krome Screw Corp. 5
Jones & Lamson Machine Co.. 29
Knu-Vise, Incorporated 46
Lewthwaite Machine Co., T. H. 48
Logansport Machine, Inc. 49
McKenna Metals Co. 53
Monarch Machine Tool Co. ... 37
Morse Twist Drill & Machine Co. 33
Motor Tool Mfg. Co. 36
National Broach and Machine Co. 1
National Tool Salvage Co. 44
National Twist Drill & Tool Co. 51
OK Tool Co. 40
Potter & Johnston Machine Co. 31
Pratt & Whitney Div. 2
Q-C Engineering Products 40
Racine Tool & Machine Co.... 48
Rickert-Shafer Co. 36
Scully Jones & Co. 39
Sheldon Machine Co., Inc. 44
Smit & Sons, Inc., J. K. 50
South Bend Lathe Works 20
Standard Gage Co., Inc. 3
Starrett Co., The L. S. 23
Strong, Carlisle & Hammond Co., The 42
Stuart Oil Co. Ltd., D. A. 28
Swartz Tool Products Co., Inc. 44
Taft-Peirce Mfg. Co., The 24
Tannewitz Works, The 52
Tomkins-Johnson Co., The 18
Union Carbide & Carbon Co... 43
Universal Engineering Co. ..... 50 and 52
Victor Machinery Exchange... 54
Vinco Tool Co. 47
Warner & Swasey Co. 19
Wetmore Reamer Co. 41
Wilson Mechanical Instrument Co., Inc. 50
Ziegler Tool Co., W. M. 46

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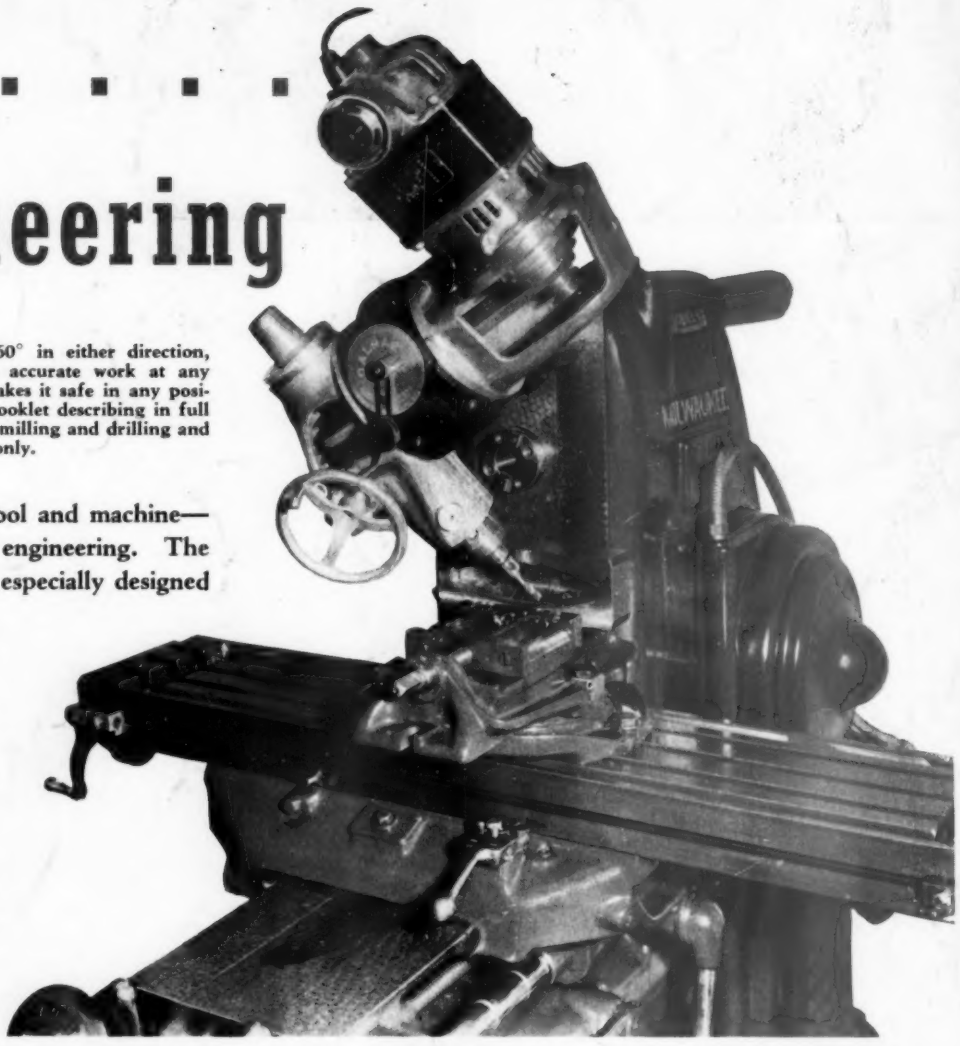

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